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ORIGINAL MEMOIRS.

CARCINOMA OF THE ŒSOPHAGUS.

A CLINICAL AND PATHOLOGICAL STUDY FROM THE PATHOLOGICAL DEPARTMENT
OF THE ST. LOUIS UNIVERSITY MEDICAL SCHOOL.

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THE following case history with the appended autopsy findings is of more than usual interest, both from the clinical and pathological point of view:

L. H., 55 years old, of German nativity, a brewer by occupation, applied for treatment on July 4, 1906.

Family History.—Negative.

Past History.—Up to the onset of his present illness the patient was never sick. He has always had a chronic eczema of the face and neck, but has never been bothered much by it. He denies gonorrhœal and syphilitic infections.

Present History.—One year ago he noticed that he was gradually growing hoarse. This hoarseness did not follow a cold, and was accompanied neither by disturbance of the respiratory function nor by any laryngeal discomforts or pain. A few months after he first noticed the hoarseness he began to experience slight difficulty in deglutition, particularly on attempting to swallow an insufficiently masticated piece of meat. This difficulty in swallowing gradually grew more pronounced so that chopped meat and mashed potatoes, and finally only fluids could be taken. Of late even the swallowing of fluids has been accomplished with difficulty. He locates the obstruction just within the upper

aperture of the thorax. Hand in hand with the difficulty in deglutition there has been an increasing sense of weakness, and a progressive loss of weight from 210 to 150 pounds. Pain has never been a symptom of the disease and all other bodily functions except those of phonation and deglutition are normally performed. There is an occasional tendency to cough, with mucopurulent expectoration, which, however, has never been blood streaked.

Physical Examination.—Tall, emaciated individual. Scaly eczema of neck and both cheeks. Tongue moist and clean. Teeth and gums in good condition. Complexion that of pronounced secondary anemia. Pupils equal, reacting sharply to light and accommodation. A few small lymph nodes in both axillæ and groins. Voice harsh and rasping, distant, and at times purely sibilant in quality.

Neck and Throat.—There are no enlarged cervical lymph nodes, but just below the cricoid cartilage is a hard, infiltrated mass of tissue occupying the site of the isthmus of the thyroid gland. This mass, which moves up and down with the trachea on deglutition, feels like a calcified thyroid isthmus, the skin over it being freely movable. No tracheal displacement or tracheal tug. Laryngoscopic examination shows the left vocal cord to lie in the cadaveric position, and not to participate in phonation. Attempts to swallow water are followed by regurgitation of some of the fluid through the nose, the noise of the regurgitation rendering it impossible to time the swallowing sounds by auscultation.

Thorax.—The chest is distinctly barrel-shaped, and expansion, on deep inspiration is minimal. Breathing, markedly abdominal in character, is aided perceptibly by the accessory muscles of respiration. The percussion note over the entire anterior and posterior aspect of both chests is pronouncedly tympanitic. Auscultation discloses numerous sibilant and sonorous râles over both chests, together with a prolonged expiratory murmur. The breath sounds at both bases, posteriorly, are very distant.

Heart.—It is impossible to mark out the heart borders, owing to the tympany of the overlapping emphysematous lungs. There is a soft blowing systolic murmur over the aortic valve. Neither the second aortic nor the second pulmonary sounds are exaggerated, but the sounds both at the base and at the apex are weak.

The pulse is weak, beats 76 times to the minute, and shows a pronounced tendency to intermit a beat every fourth or fifth cycle. The left radial pulse seems to be slightly weaker than the right, and to be a bit delayed. The radials are distinctly sclerotic, and the tension within them is higher than normal. The temporal vessels are tortuous and hard. There is no visible pulsation nor palpable thrill over the cardiac area.

Abdomen.—Markedly carinated. Palpation and percussion negative.

Extremities.—Negative.

Urine.—Acid. Sp. grav. 1030. Trace of albumen. Few hyalogramular casts.

Here then was a patient whose history suggested both an aortic aneurysm and a neoplasm of the œsophagus. The clearly defined onset with an involvement of the recurrent laryngeal nerve, spoke in favor of aneurysm, whereas the progressive dysphagia, to the point of complete obstruction, and the pronounced cachexia spoke for neoplasm. It was impossible to elicit any signs that would absolutely confirm the diagnosis one way or the other. Dr. W. E. Sauer attempted to establish the presence of a new growth by means of the œsophagoscope, but was unable to do so, owing to the severe dyspnoea and cyanosis caused by the introduction of the instrument. The absence of pulsation, thrill and tracheal tug, combined with the impossibility of percussing out the area of heart dullness, owing to the pulmonary emphysema, rendered it impossible to make a positive diagnosis of aneurysm.

In the hope of securing some data that might aid in differentiating between cancer of the œsophagus, and aneurysm of the aorta, the literature was searched for cases similar to the one under observation, the search resulting in the discovery of not a few cases in which it was impossible to differentiate between the two conditions. Kuchen¹ reports two cases of carcinoma of the œsophagus in which the diagnosis of aneurysm of the aorta was made, and in which the correct diagnosis was not even suspected until it was disclosed by autopsy. The French clinician Carrière² made an exactly similar error, and the great German clinician Traube³ made a similar mistake. Both Carrière and Traube were aware that the condition

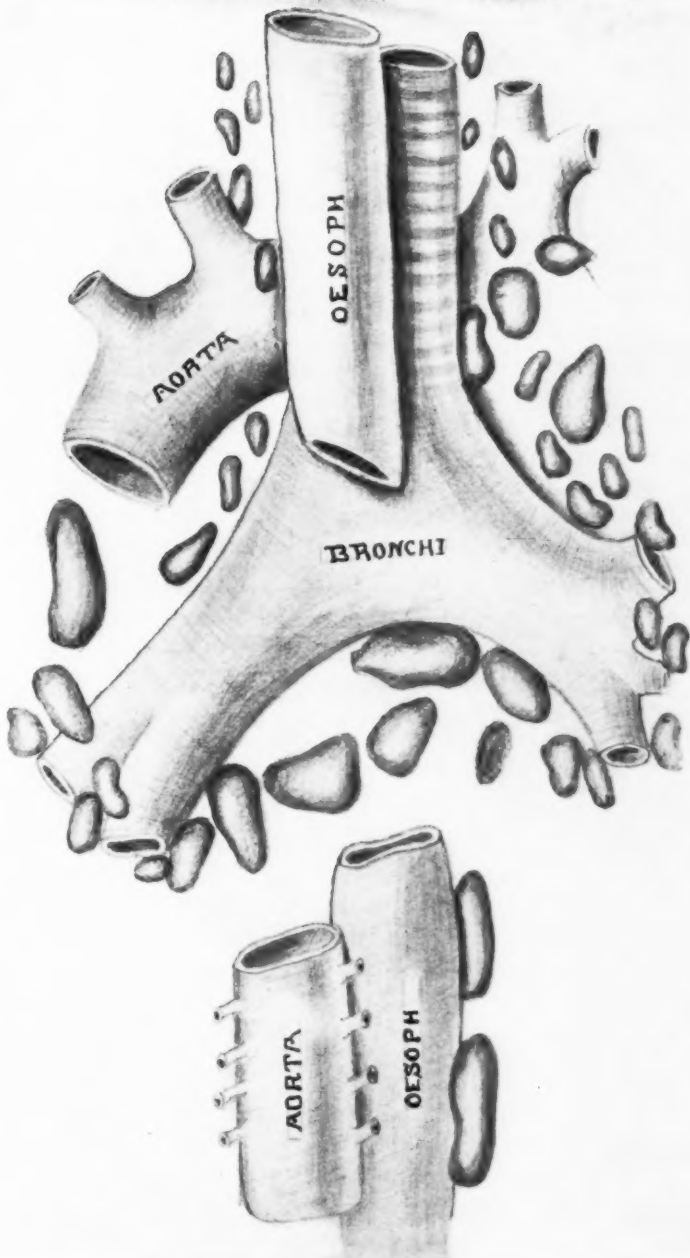
confronting them might be either aortic aneurysm or œsophageal new growth; but they made a positive diagnosis of aneurysm, only to find out their mistake, at autopsy. Gebauer⁴ reports a similar experience, as does also Kirchgaesser,⁵ and in our own country, Snow.⁶

If one will bear in mind the intimate relationship existing between the œsophagus and the lymphatic apparatus of the mediastinum, he will readily perceive how two conditions so diverse as carcinoma of the œsophagus and aneurysm of the aorta may cause almost identical symptoms. Fig. 1 represents the arrangements of the lymph nodes in the mediastinum that act as the first relays from the œsophageal lymph vessels. (See also "Ueber die Lymphgefäesse des Œsophagus," H. Sakata, Mit. a.d. Grenz. d. Med. & Chir. BXI. H. S., 1903.) These nodes are in actual contact with the œsophagus, and as a result, secondary involvement of them occurs very early after the invasion of the œsophagus by carcinoma. Such being the case we have a tumor growth started in the mediastinum which may cause all the symptoms and physical signs that are ordinarily caused by an aneurysm. Moreover, this mediastinal tumor may develop so much more rapidly than does the primary tumor of the œsophagus, as to give pronounced intrathoracic symptoms before there are any signs of obstruction of the lumen of the œsophagus. Naturally these symptoms are due to pressure on the mediastinal organs, and are therefore identical with the symptoms caused by pressure of an aneurysm on these same structures.

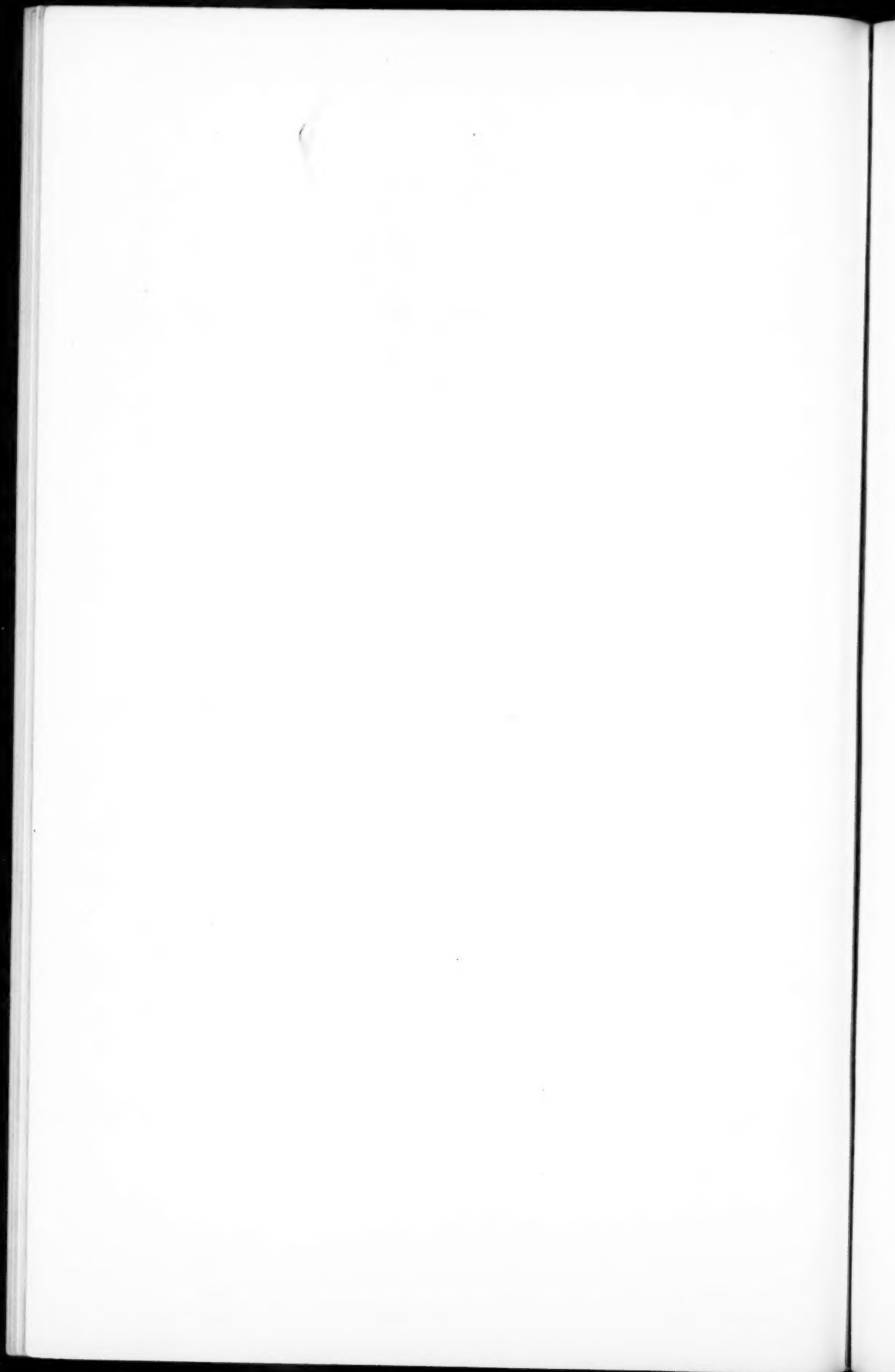
Pain (scapulo-humeral, scapulo-cervical, or intercostal) is a characteristic feature of aneurysm, supposed by Fraenkel⁷ to be due to pressure irritation of branches of the cardiac plexus ramifying in the periaortic connective tissue. But both Kucken (l.c.) and v. Ziemssen⁸ state that carcinoma of the œsophagus may be accompanied by severe, spontaneous pain, simulating in every detail the pain caused by aneurysm.

Dyspnœa, which is a fairly constant sign accompanying aneurysm is almost as constant a characteristic of carcinoma of the œsophagus. This symptom, just as is the case with the

FIG. 1.



Arrangement of the tracheo bronchial lymph nodes, after Hallé, in Poirier and Cuneo ("The Lymphatics," Chicago, 1904).



symptom of pain, is referable to pressure by either the aneurysm or the mediastinal metastasis from the œsophageal new growth, on the bronchi or trachea.

Involvement of the recurrent laryngeal is usually regarded as a strongly confirmatory sign of aortic aneurysm; but such an assumption is not warranted by facts. For example, Schech⁹ collected 42 cases of paralysis of this nerve, and in the series, he found that 5 cases were due to aneurysm of the aorta, 4 to carcinoma of the œsophagus, and 3 to mediastinal and pulmonary tumors. These figures and similar ones collected by Hampeln¹⁰ and Avellis¹¹ illustrate of how little aid the symptom of recurrent laryngeal paralysis is, in differentiating between the two conditions. Ehret¹² cites a case of carcinoma of the œsophagus in which the only symptom of importance was hoarseness, due to involvement of the recurrent laryngeal nerve. It has been suggested that in aneurysm the degree of hoarseness varies from time to time, owing to slight changes in the position of the aneurysmal sac, whereas in carcinoma of the œsophagus, the paralysis is a constantly progressive one. But even this distinction does not hold always, for in the case cited by Kucken (l.c.) varying degrees of hoarseness were caused by an œsophageal tumor, the recurrent laryngeal nerve not being directly involved in the mediastinal metastasis, being encroached upon merely by a local œdema, which varied from time to time, and which was caused by the presence of the new growth in the immediate neighborhood.

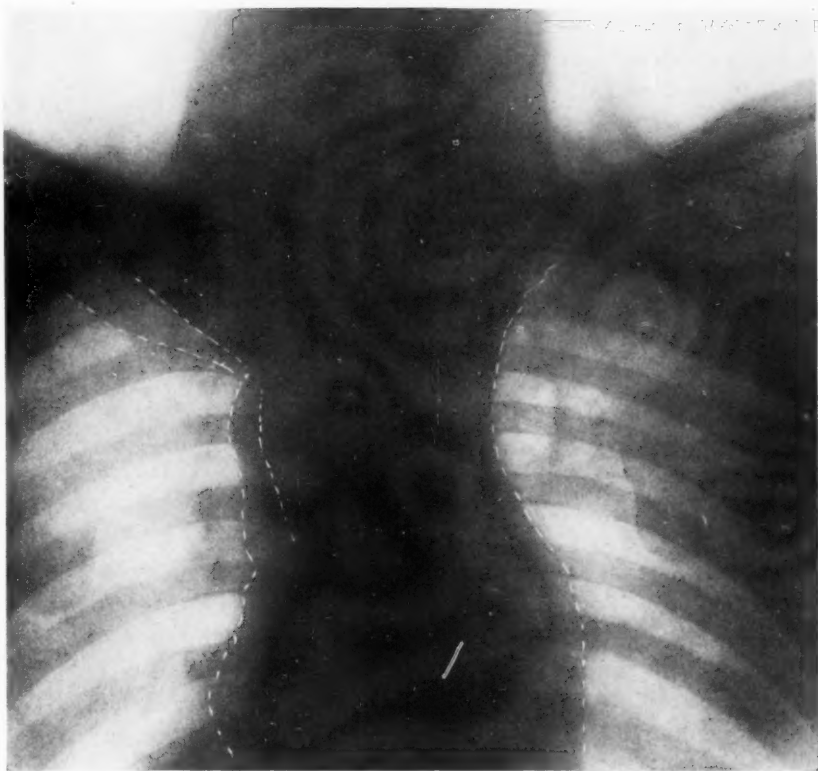
Dysphagia very naturally suggests that we are dealing with a tumor of the œsophagus. Lebert,¹³ however, states that in one third of all cases of aneurysm of the aorta, the œsophagus is compressed sufficiently to cause dysphagia. Even if the sac does not press directly on the œsophagus it can cause dysphagia by pressure on the vagus and its œsophageal branches. It is also a fact that a cancer of the œsophagus may grow only in the long axis of the tube, so that it causes no obstruction; or the growth may extend around the lumen of the œsophagus and be ulcerated sufficiently to preserve a free passageway for food.

Even the presence of a well marked cachexia does not add very strong corroborative evidence of a malignant neoplasm, for we are obliged to express our knowledge of cachexia in terms of a secondary anæmia, and a large proportion of all patients suffering with aneurysm of the aorta show a well pronounced secondary anæmia, due to a complicating nephritis, or endarteritis.

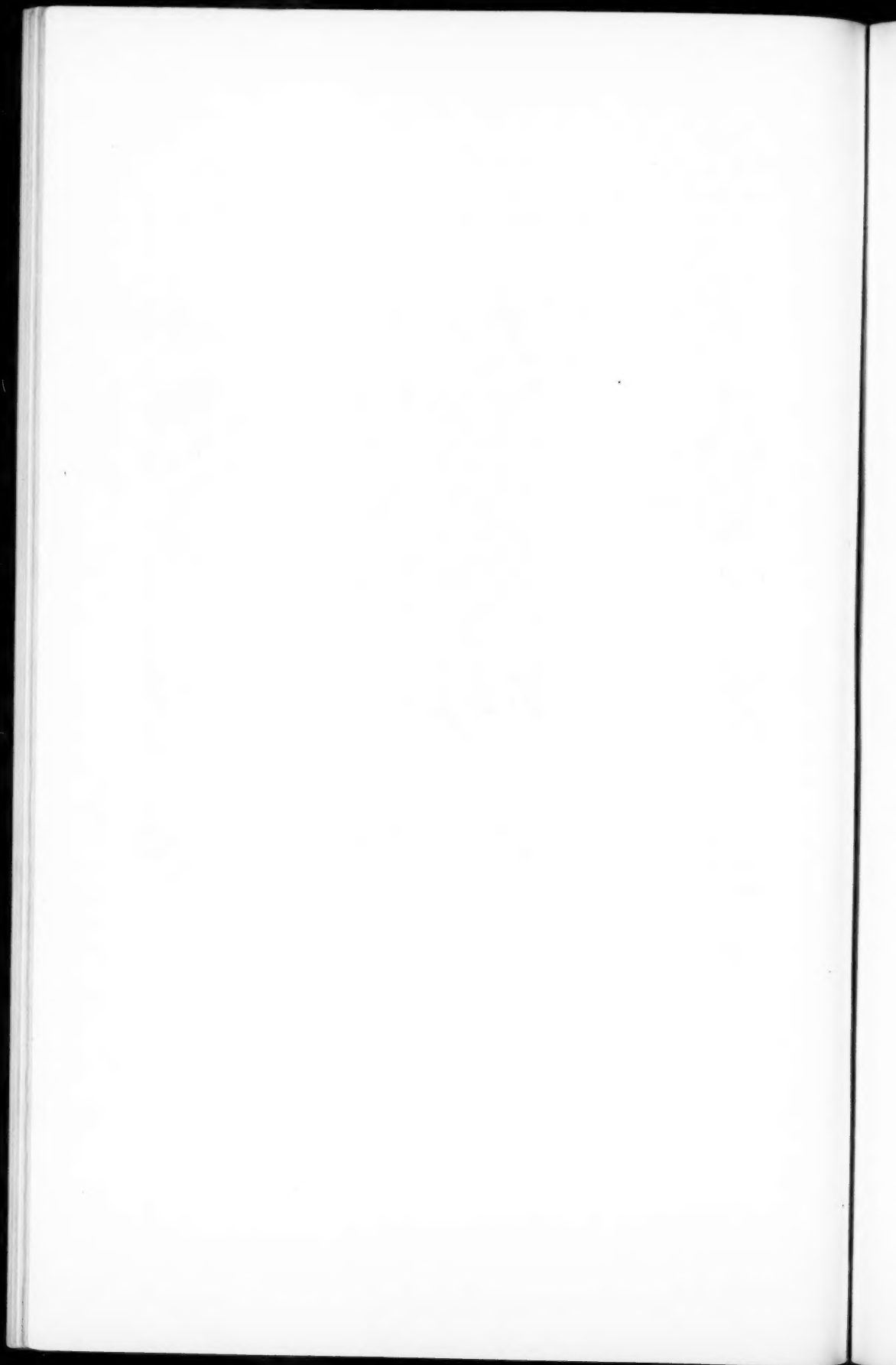
Thus we see, that all the cardinal signs of both conditions may fail to lead to a correct conclusion. A few years ago, it was hoped that the use of the X-ray would enable us to differentiate between aneurysm and carcinoma of the œsophagus with a degree of absolute surety, but Kuchen's two cases (l.c.), Kirchgaesser's case (l.c.) and my case illustrate the fact that this hope was baseless. Fig. 2 shows an X-ray of the thorax of my patient. The shadow (outlined with dotted white line) is strikingly similar to the outlines of various aortic aneurysms of the aorta pictured in Walsham and Orton's work¹⁴ and by Stover and Hall.¹⁵ Moreover, the lighter shadow seen between the two dotted lines at the left margin of the outline represent pulsation, which was also clearly seen through the fluoroscope. In Kuchen's and Kirchgaesser's cases the diagnosis of aneurysm was falsely based on a similar X-ray picture of a pulsating tumor. In reality, the shadow represents the mediastinal mass of new growth to which pulsation is transmitted by the underlying aorta. I am indebted to Dr. R. D. Carman both for the excellence of the X-ray work, and for many valuable suggestions in interpreting the X-ray findings.

A consideration of the conflicting testimony offered by these various subjective and objective signs fully substantiates the statement of Kuchen that great, and often insurmountable difficulties in diagnosis attend cases of carcinoma of the œsophagus when the growth is situated in the thoracic portion of this viscus, and particularly when there is an early involvement of the mediastinal connective tissue. In the particular case under discussion, Dr. Iralsen who had referred the patient to me, Dr. Sauer who also examined the patient, and I myself

FIG. 2.



X-Ray of mediastinal metastasis from an intra esophageal carcinoma. Shadow of the heart fuses with the shadow of the new growth. Lighter shadow between the dotted lines on the left represents pulsation of the mass transmitted by the underlying aorta.



inclined most strongly to the diagnosis of carcinoma, chiefly on account of the complete oesophageal obstruction.

The patient consented willingly to the proposal that a permanent gastric fistula be made, and agreed to enter the hospital within a week. At my first hospital visit to him a week after my first examination, he informed me that for two days past he had been able to swallow with perfect ease, that he had even tested his swallowing capacity by eating green corn, and stated that he was able to swallow whole mouthfuls of unmasticated kernels without the slightest difficulty. This ability to swallow returned suddenly as he was attempting to eat a piece of meat by way of experiment. The patient himself was hopeful that this fact would render the operation unnecessary, but we construed it to be the only one definite sign that made the diagnosis of carcinoma almost certain. The dysphagia accompanying an aortic aneurysm may vary in degree, as we have seen above, dependent upon slight changes in the position of the aneurysmal sac, but such changes in position never lead to a sudden complete restoration of the lumen of the oesophagus. Such an occurrence as this must be dependent upon a diminution in the size of the compressing sac, due to sudden rupture or perforation, phenomena which give rise to serious general symptoms. Our patient experienced no threatening symptoms, merely passing quietly from a state of complete dysphagia, to one of unimpeded swallowing, due, we thought, to ulceration of an obstructing oesophageal tumor.

Considering the restored function of swallowing as a confirmatory sign of carcinoma of the oesophagus, we performed a typical Senn gastrostomy under $\frac{1}{2}$ per cent. cocaine local anaesthesia. The operation was done on the basis that the new growth would be sure to obstruct the oesophagus again, at a later date, when perhaps the condition of the patient would be such as to preclude the idea of operative interference. The operation disclosed a markedly contracted stomach, but there was no demonstrable evidence of new growth either in the abdominal portion of the oesophagus, or in the cardiac end of the stomach. The patient left the hospital on the tenth day after the operation with a thoroughly efficient gastric fistula.

The subsequent course of the disease was marked by a transitory gain in weight and strength, due to the ability to take more nourishment. After the elapse of a month, however, weak-

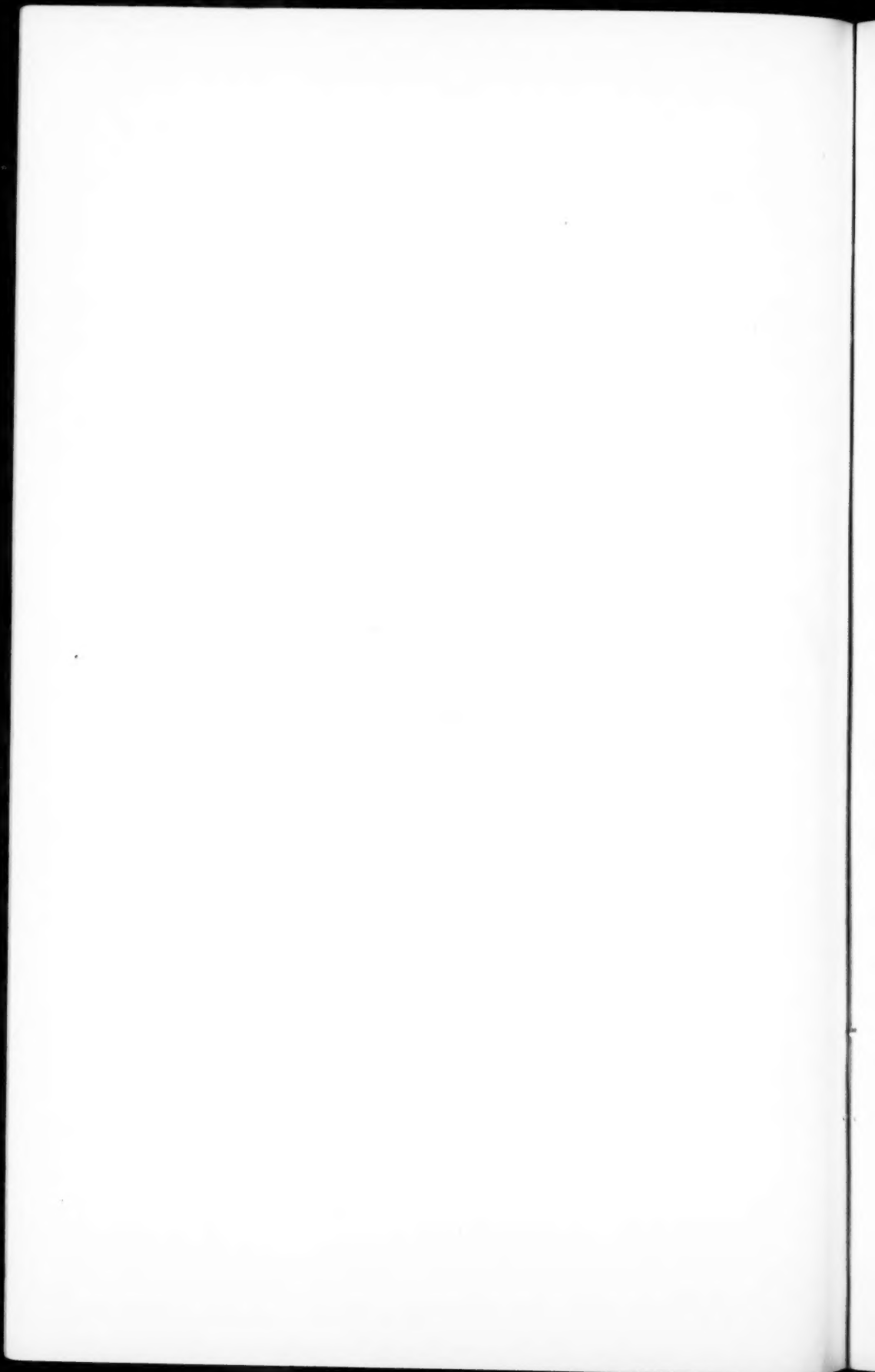
ness began to be a pronounced symptom; and five weeks after the operation the patient was obliged to take to his bed. Up to this time he ate freely of all varieties of food. Gradually, signs of obstruction reappeared and progressed so that six weeks after operation the patient was unable to swallow fluids. At this same time a distressing cough developed, accompanied by a very foul muco purulent expectoration. The weakness grew more and more profound despite frequent feedings through the fistula, and death supervened eight weeks after operation.

The autopsy, performed six hours after death by Dr. D. L. Harris, disclosed nothing of importance except in the thorax, therefore only that part of the protocol relating to the mediastinal structures will be stated: The entire mediastinum, from the upper aperture of the thorax down to the diaphragm was filled with a dense nodular mass, slightly fusiform in shape, the greatest diameter of the spindle being posterior to the fourth sternocostal articulations. This mass, which was a pearl gray in color, extended through the upper outlet of the thorax into the root of the neck, where it seemed to end by infiltrating the isthmus of the thyroid gland. Within the chest, the mass was fused with the lungs at their roots, but throughout the rest of its extent it was not intimately attached to the lungs. The whole mass which was removed in connection with the neck organs, is shown in Fig. 3. Six cm. below the laryngeal aperture, there is an irregular cavity the size of a small hen's egg opening into the anterior wall of the oesophagus. The walls of this cavity, lined with a foul, greenish-black, necrotic membrane, are made up of the jagged, eroded remains of six or eight tracheal rings on the right, and by tumor mass on all other sides. Six cm. below this cavity there is another one of exactly the same character, except that it has no tracheal remains in its makeup, and is smaller in extent as a result of not having ulcerated so deeply. This lower cavity has not ulcerated into the mediastinum. Extending from the upper to the lower cavity, is a chain of markedly enlarged firm anthracotic periesophageal lymph nodes, which on section show unmistakable evidences of invasion by new growth. Sections made from the walls of both cavities, from the isthmus of the thyroid, from the mass of mediastinal tissue, and from the periesophageal lymph nodes all showed typical squamous cell carcinoma (epithelioma).

FIG. 3.



Neck organs, œsophagus and mediastinal metastasis, showing two ulcerating epitheliomata of the œsophagus. The upper ulcer has eroded and destroyed most of the trachea.



These findings, although they confirmed the diagnosis of an obstructing carcinoma of the œsophagus, were surprising in that they disclosed a second unsuspected tumor at the lower end of the viscus. The presence of this second tumor immediately suggested the possibility of determining whether or not we were dealing with two primary tumors of the œsophagus, and at the same time of determining along what courses metastases occur in an œsophagus that is the seat of multiple tumors.

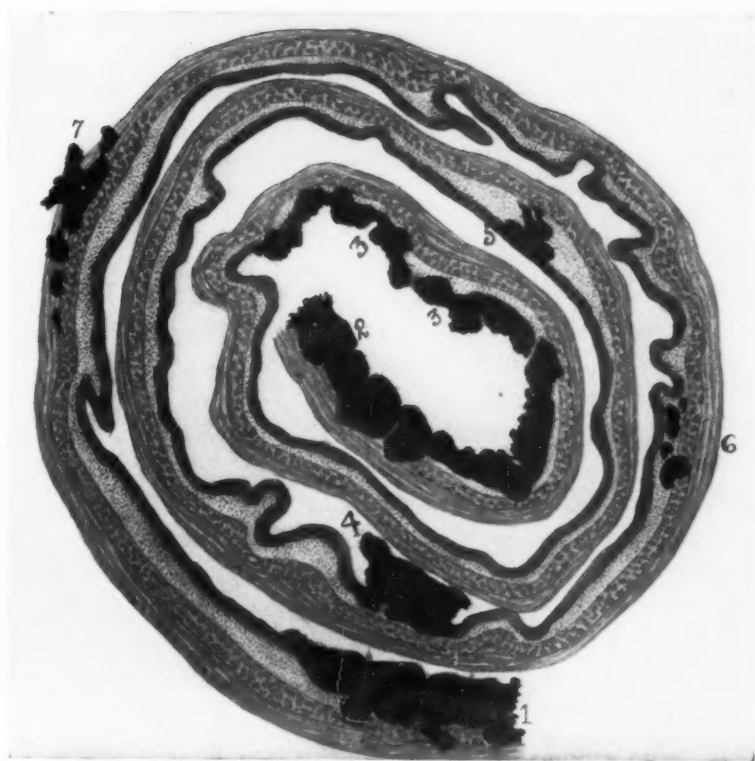
As regards the first problem, namely, whether the two tumors were primary or not, it is practically impossible to show that two morphologically identical tumors occurring in the same organ, are primary tumors. Had the upper tumor been a squamous cell carcinoma, and the lower one a cylindrical cell carcinoma, one would have been fairly well justified in pronouncing them to be two primary tumors. As the case stood, however, the rational assumption was that the lower tumor was secondary to the upper one, for it was smaller in size, less widely surrounded by dense extra œsophageal new growth, and less extensively ulcerating. Any one attempting to prove that these two tumors were both primary would have to bear in mind that there are similar cases quoted in literature, in which it was impossible to prove this point (Beck¹⁶) and that pathologists contend that a diagnosis of multiple primary tumors should only be made after excluding every possibility of any type of metastasis. Bucher¹⁷ and Billroth¹⁸ went even further than this, in claiming that a diagnosis of multiple primary tumors may be made only when:

1. The tumors have different histological structures.
2. Each tumor has a genetic relationship with the tissue in which it is growing.
3. Each tumor makes its own metastases.

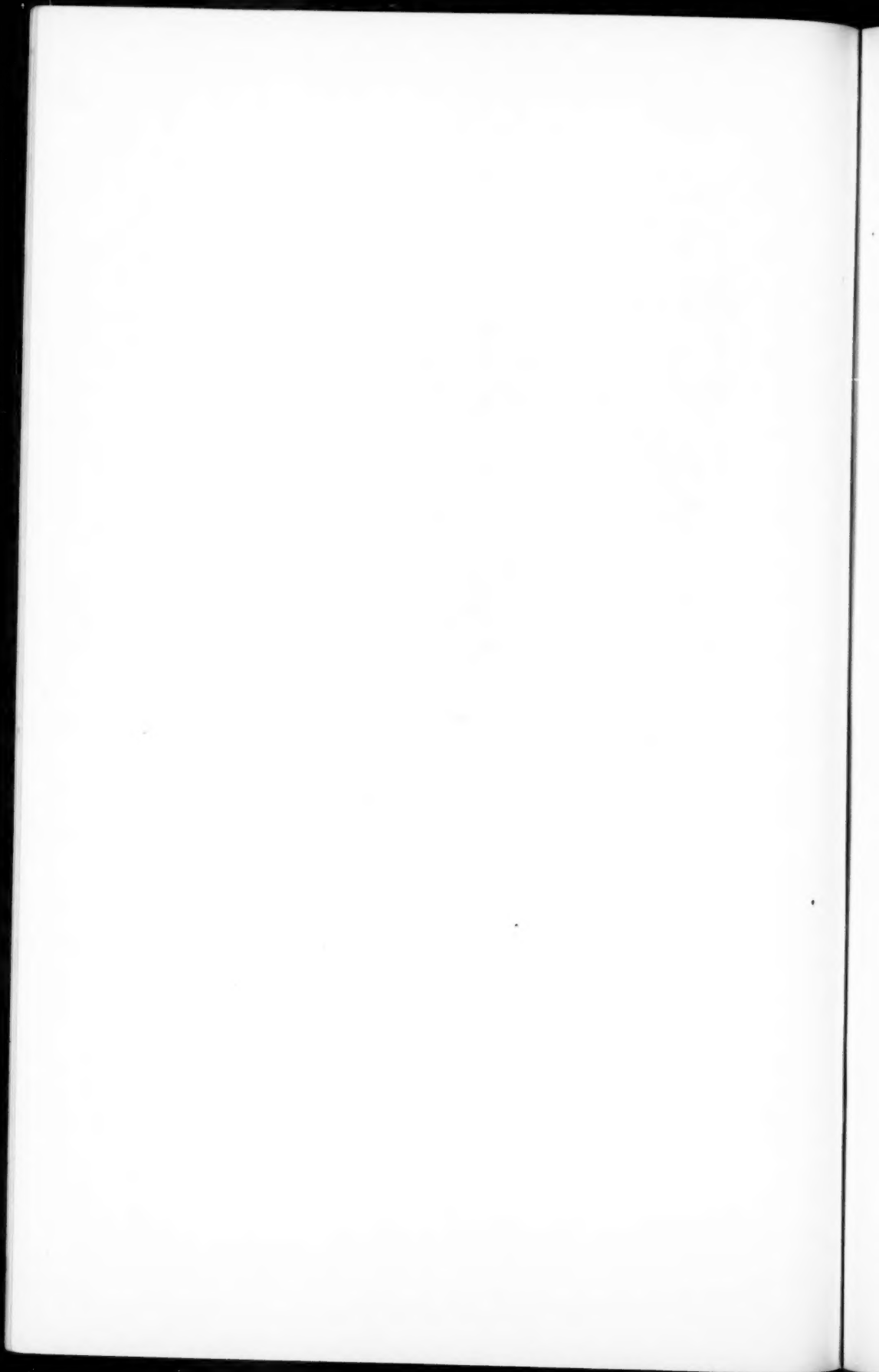
Assuming then, that the lower tumor was a secondary growth, the problem as to how it originated remained to be solved. In order to solve it, it was necessary to dissect the œsophagus out of the bed of the new growth in which it lay, preparatory to making a serial section study of the entire organ. Very little dissection was necessary, for the œsophagus was

adherent to the bed of new growth only at the margins of the upper and lower ulcers. After this dissection was accomplished, the œsophagus (which had previously been opened down the middle line anteriorly) consisted of a ribbon of tissue 5 inches long, $1\frac{1}{4}$ inches wide, and about 1-10 of an inch thick. In order to avoid working with the enormous number of sections that would have resulted from cutting this strip of tissue transversely throughout its whole length, the strip was rolled upon itself much as a piece of dough is rolled to make a "jelly roll." With the strip held in this form by means of a piece of thread tied around it, it was fixed, hardened, and embedded. Fig. 4 is a diagrammatic representation of sections cut through the rolled up strip. The jet black coloring, represents deposits of new growth. No attempt is made to picture the histological structure of the coats of the œsophagus, or of the new growth itself; but the black deposits are exact reproductions in outline of various types of metastases that were met with, in looking over all the sections. The centre of the spiral strip represents the tumor that was situated at the upper end of the œsophagus, and is labeled 2. 1 shows the tumor that was situated at the lower end of the œsophagus. 3 represents a type of growth by continuity, extending down the œsophagus from the primary tumor. 4 is a small polypoid tumor which has all the characteristics of an implantation metastasis on the mucosa. This small tumor dips well down in the submucosa, but has grown most actively out into the lumen of the œsophagus. 5 represents a similar small metastasis which, however, instead of growing into the lumen, has grown outward toward the muscularis by means of two or three tongue shaped processes. 6 shows a metastasis confined exclusively to the submucosa and evidently originating in some of the lymph spaces of this coat of the œsophagus. 7 represents a deposit that grew into the lymph spaces of the muscularis from the outlying mass of carcinomatous tissue. Among all of the sections examined I could find none that showed lymph vessels crowded with squamous epithelial cells, so it was impossible to trace any of the metastases back to their original source

FIG. 4.



Diagrammatic representation of the various types of metastases in a case of multiple carcinoma of the oesophagus (see text for description).



through a series of sections. Hundreds of sections were examined without finding in them any evidence whatsoever of metastases, and no single section contained more than one type of metastasization. For the sake of convenience all the types of metastases found are represented on one chart.

This work was done because I could not find a detailed study of the course along which metastases occur in the œsophagus. An encyclopedic work, such as Borst's "*Geschwulstlehre*," merely makes scant mention of the fact that there may be variously distributed intra-œsophageal metastases, whereas most of the larger works on surgery do not say even as much as that. It was not hoped that any definite scheme could be demonstrated whereby either the occurrence or route of intra-œsophageal spread of new growth could be explained. The whole question of metastases formation is still too much involved to admit of the deduction of any firm and fast laws. For example, Bucher (l.c.) contends, in a lengthy and learned article, that we are never justified in calling a small deposit (such as No. 4 and Fig. 3) an implantation metastasis, until every other possible method of metastasization has been ruled out. He believes that most of the so-called implantation metastases are, in reality, metastases that have occurred by retrograde lymph transport. Carmalt¹⁹ also speaks of the great difficulty of proving that a small metastasis in the œsophagus is in reality an implantation growth. He mentions the possibility of a particle of the epithelial lining becoming detached high up, and clinging so closely to a spot lower down that it presents all the appearances of an epithelial new growth. In our own case this is surely not true, for the submucosa is invaded by the small metastasis.

The study of the foregoing case demonstrated the difficulty of differentiating aneurysm of the aorta from carcinoma of the œsophagus by means of clinical data, illustrated the formation of multiple metastases in the œsophagus, and suggested that these multiple metastases may occur (a) by implantation, (b) through the lymph spaces in the submucosa, (c) by extension into the œsophagus from a mediastinal

metastasis, (d) by continuous growth above the lymph spaces of the mucosa, and (e) through the lymph spaces of the muscularis.

- ¹ Kucken, *Deutsch. Med. Woch.*, nos. 45-47, 1902.
- ² Carrière, *Arch. Clinique de Bordeaux*, Bd. xvi, no. 1.
- ³ Traube, *Arch. f. Heilkunde*, Bd. xvi, H. 3.
- ⁴ Gebauer, *Deutsch. Med. Woch.*, no. 35, 1900.
- ⁵ Kirchgaesser, *Muench. Med. Woch.*, no. 19, 1900.
- ⁶ Snow, *Univ. of Penn. Med. Bulletin*, December, 1904.
- ⁷ Fraenkel, *Deutsch. Med. Woch.*, nos. 50-51, 1891.
- ⁸ v. Ziemssen, *Handbuch. d. Spec. Path. und Ther.*, Bd. vii. 1.
- ⁹ Schech, *Muen. Med. Woch.*, no. 51, 1888.
- ¹⁰ Hampeln, *Zeit. f. Klin. Med.*, February, 1901.
- ¹¹ Avellis, *Berl. Klinik*, H. 40, 1891.
- ¹² Ehret, *Deutsch. Med. Woch.*, no. 36, 1901 (supplement).
- ¹³ Lebert, *Virchow. Hand. d. Spec. Path. und Therapie*, B. V. Th. 2.
- ¹⁴ Walsham and Orton, *The Roentgen Rays in the Diagnosis of Diseases of the Chest*, London, 1906.
- ¹⁵ Stover and Hall, *Boston Medical and Surgical*, January 1, 1907.
- ¹⁶ Beck, *Zeit. f. Heilkunde*, B. 5, 1884.
- ¹⁷ Bucher, *Beit. z. Path. Anat.*, B. xiv.
- ¹⁸ Billroth, *Allg. Chir. Path. und Ther.*, 1889, p. 908.
- ¹⁹ Carmalt, *Virch. Arch.*, B. 55.

TONSILLAR HEMORRHAGE AND ITS SURGICAL TREATMENT.

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FEW operations in surgery are so generally done badly as those upon the tonsils. Tonsillotomy is an easy but an utterly unjustifiable operation. Tonsillectomy is an exceedingly difficult operation to do ideally. Personally, the author is satisfied with but few of his tonsillectomies.

Nearly all operators at the present day slice off the projecting portion of the tonsil with a tonsillotome, apparently with the mistaken idea that the object is to rid the patient's throat of the mechanical obstruction to the passage of air caused by this projecting portion. Such an operation seals up the glandular tissue of the deeper portion of the tonsil under bands of cicatricial tissue which forever will interfere with throwing off of leucocytes, secretions, epithelial and other debris which will for years continue to be produced if any glandular tissue be left behind. If the patient has had periodical attacks of acute tonsillitis, he will have them more often than before. Patients frequently allude to such a case when tonsillectomy is proposed, mentioning the fact that the patient was made worse instead of better. One of the reasons why most operators hesitate to remove all of the tonsil is the fear of hemorrhage. As a matter of fact, hemorrhage is much more likely to occur after partial than after complete removal, for the vessels of the diseased glandular and cicatricial tissues do not retract as do those of the normal tissues in the bed of the tonsil. However, it is not on this account that tonsillectomy is urged in preference to tonsillotomy. "Rheumatism," infective arthritis, endocarditis, tuberculosis and a host of other ills that modern research has traced in many instances to the tonsils are made worse or their occurrence is rendered more likely by incomplete removal.

The proper and surgical way to remove the tonsil is to dissect it out completely capsule and all clear down to its bed of muscular tissue, and then immediately deal with the hemorrhage by twisting the vessels with long hemostats. Oozing of more than a few minutes duration after tonsillectomy is exceedingly rare. Dozens of times the author has been called in consultation where the bleeding was said to be an oozing and he has found upon lifting forward the anterior pillar an artery spurting. If the pillar was allowed to fall back into place the spurting jet struck against the posterior surface of the pillar and, flowing over the tonsillar wound, simulated an oozing from the wound so closely that any one who did not take the precaution to lift the anterior pillar would never suspect the source of bleeding.

Oozing is simulated in another way. If spurting arteries and bleeding veins, be not twisted, as they should be, promptly after the removal of the tonsil, some of these vessels may partially retract, yet not sufficiently to stop bleeding, and being covered with a layer of fresh clot, may keep on bleeding for hours in what seems to be an oozing. Had torsion with hemostats been promptly applied when the tonsil was removed there would have been no oozing. Vessels too small to be seen and twisted cannot bleed more than a short time, except in cases with abnormal blood as in hemophilia, or with abnormal vessels as in general arterial changes, or local changes due to disease or its products in the tonsillar tissue. Obviously, the latter cannot be a factor if the tonsil be entirely removed. The snare is apt temporarily to close the vessel mouths which later will open owing to mechanical movements of the musculature surrounding the wound. It is far better to do a clean cutting surgical operation, promptly followed by surgical hemostasis with hemostats promptly applied to all bleeding vessels while they are readily located by their blood streams. If the anterior pillar be retracted the vessels can always be seen after any tonsillectomy worthy of the name.

Oozing properly so-called is the bleeding from numerous vessels too small to be twisted or ligated. This occasionally

occurs from the muscular, cicatricial or other tissue in the wound after the removal of the tonsil. This can be immediately stopped by the insertion of a gauze sponge, which will be held in place by the pillars. If there be not a large enough cavity for the retention of a sponge the size of a walnut, it may nine times out of ten be truthfully said that a complete tonsillectomy has not been done.

The best instrument for removal of the tonsil is largely a matter of personal custom. The author has always maintained that the tonsillotome was an unjustifiable instrument,

FIG. 1.



Author's tonsil scissors.

because it sliced off the projecting portion of the tonsil leaving the submerged portion to be sealed over with cicatricial tissue. He has found recently, however, that the fault is not with the tonsillotome, but with the tonsillotomist. Dr. George L. Richards has demonstrated that it is possible to do a tonsillectomy with a tonsillotome. He frees the tonsil with his finger until it is possible to pull the tonsil out so that a pedicle is formed. Then he severs the pedicle with a tonsillotome from which the fork has been removed. A forceps is used to pull out the tonsil, the ring of the tonsillotome being first threaded over the

forceps, from the shank of which the tonsillotome dangles while the tonsil is being seized. If the same care in freeing the tonsil and pulling it out to a pedicle be taken, the snare might be used, and the author has often so used it. But the objection to the snare is the same as to ice and other hemostatics, that while it lessens hemorrhage at the time, it is more

FIG. 2.



Author's anterior pillar retractor.

apt to be followed by secondary hemorrhage. It is far better to make a clean cut which will bleed freely, and let the operator see the large vessels that he may apply torsion.

Ballenger does a beautiful operation with a knife.

The author's preference is for the scissors, and he uses the scissors shown in Fig. 1. He pulls out the top of the tonsil with a Sandels' forceps, and at the first clip gets external to

FIG. 3.



Author's tonsillar hemostat.

the capsule which is then rapidly ripped away from the tonsillar bed entire and attached to the tonsil, using the blunt end of closed scissors blades as a dissector. Occasionally old cicatrices from peritonsillar abscesses will require clipping.

The anterior pillar is then lifted with a retractor (Fig. 2) while the hemostat serves as a tongue depressor, if one is needed, and the bleeding vessels are immediately found and twisted with the hemostat (Fig. 3) while they are readily seen

by the free flow of blood from their open mouths immediately following their severance. It is to urge this surgical hemostasis at operation, and to point out the error of using ice and other hemostatics to stop bleeding which, if thus stopped, is prone to recur subsequently, that this paper is written. As elsewhere urged by the author (*N. Y. Med. Jour.*, Aug. 17, '07) when the bleeding cannot be arrested, or having stopped, is likely to recur and be fatal, external carotid ligation should be done at once. It is a simple operation of ten or twenty minutes' duration: it may be done under infiltration anesthesia and it is practically without ulterior unfavorable results.

CONCLUSIONS.

1. Tonsillotomy is an unjustifiable operation.
2. Tonsillectomy is less likely to be followed by hemorrhage than is tonsillotomy.
3. Oozing after tonsillectomy is exceedingly rare. It is bleeding from a vessel concealed back of the anterior pillar that is usually mistaken for oozing.
4. The use of ice to the neck and face, or locally over the wound and other hemostatics, are unsurgical and are liable to be followed by secondary hemorrhage.
5. A gauze sponge pushed into the cavity left by the removal of the tonsil will stop slight bleeding, but should never be used when the bleeding is from a vessel large enough to be twisted. If there is not a sufficient cavity to permit the retention of a gauze sponge the size of a walnut by the anterior and posterior pillars, the tonsil is not all out, and the operation is incomplete.
6. Hemostasis with hemostats, promptly done while the vessels are plainly visible by their bleeding immediately after they are severed, promptly arrests hemorrhage and the torsion forestalls secondary hemorrhage.
7. Any hemorrhage not controllable by torsion can be and should be immediately stopped by rendering the whole area anemic by the ligation of the external carotid artery.
8. An anterior pillar retractor and a few long hemostats are an absolute essential to every tonsillectomy armamentarium.

LINGUAL GOITRE.

BY R. A. STIRLING, M.D.,

OF MELBOURNE, AUSTRALIA,
Surgeon to the Melbourne Hospital.

IN the *Lancet* December 8, 1906, Mr. G. H. Makins relates a case of lingual goitre, and states that in the various collations of published cases, not more than between thirty and forty instances have been recorded.

It is very remarkable that soon after reading the excellent description of the tumor in his case, an almost precisely similar one was referred to me by Mr. Phillpotts, one of the dental surgeons at the Melbourne Dental Hospital.

The patient, Vena L., aged twelve, was a bright, healthy looking girl. She states that two years ago she complained to the family medical attendant of sore throat—when he called her attention to a swelling at the back of the tongue. This had never been noticed before, but she has found since, especially latterly that there was increasing difficulty in swallowing and speech. There has never been any bleeding from the tumor. She has always been healthy and has not yet menstruated. She complains of thickness of speech, and thinks that the tumor has increased in size recently, and there is always some difficulty in breathing whenever she catches cold.

She was in a hospital some months ago, where it was proposed to remove the tumor, but her father demurred at the possibility of the tongue being divided in the centre.

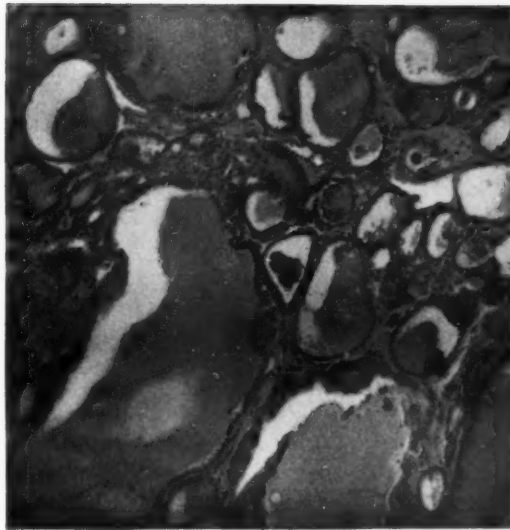
On inspection of the mouth, there is a rounded swelling, about the size of a very large marble, placed on the centre of the base of the tongue (Fig. 1), projecting upwards between the fauces, and apparently springing from the region of the foramen cæcum; the tumor is pinkish in color, covered with mucous membrane showing a very vascular network, and extends down towards the epiglottis for an inch and a quarter—but the laryngoscope shows it is not attached to the epiglottis. Palpation proved that the tumor was not exactly in the midline; that it

FIG. 1.



Lingual Goitre.

FIG. 2.



Microscopic section of lingual thyroid.



extended more to the right than to the left, semi-elastic in consistence, and not giving one the impression of a cystic condition, but rather of a functioning glandular mass.

I could not be certain that the lateral lobes of the thyroid were present in the neck—but at the operation there was no trace of an isthmus.

The diagnosis lay between a lingual goitre and a dermoid cyst. A chronically inflamed lingual tonsil could be ruled out—as it is an affection belonging to the middle period of life, is always associated with pharyngeal dysesthesia, and instead of the circumscribed smooth surface of this tumor, nodular elevations exhibiting a well-marked umbilication are found.

Storrs states that a dermoid cyst in this position is generally yellow, grows rapidly, pits on pressure, and has not the vascularity of goitre.

Operation, May 14, 1907.

Dr. Grubley gave the anæsthetic—chloroform at first on a mask, and then through a tracheotomy tube. Dr. H. B. Devine, my house surgeon, assisted.

On account of the great vascularity of the growth, and of the difficulty of working in so confined a field, it was thought advisable to do a preliminary tracheotomy, especially so in the event of the tumor proving to be her only supply of normal thyroid tissue, Christiana's method of thyroid grafting as quoted by Lannelougue would have been compulsory, or else implantation of thyroid tissue into that of the spleen.

The mouth was gagged, the tongue well drawn out with silk thread, and the pharynx plugged with a sponge. The mucous membrane at the base of the tumor was much hypertrophied and was freely incised. The growth was now enucleated by means of the finger and scissors; a small bridge of tissue at the base being left.

The bleeding was extremely free, but was controlled by sponge (on holder) pressure against the base of the tongue until three deep silk sutures could be inserted—a rather difficult manœuvre in such a position.

The tracheotomy tube was now withdrawn, two catgut sutures closing the opening in the trachea completely.

It was found that a small thyroid was present in the normal position. A few superficial sutures completed the operation. For

four days the pulse rate varied from 140 to 120; but since then it has remained the same as before the operation, and on the fifth day she was up and about the ward—and discharged on the eighth day. So far (June 25th) she has remained perfectly well.

Report by Dr. R. J. Bull on the microscopical examination of the goitre.

The tumor was roughly bilobed, rounded, of about the size of a walnut, and of firm elastic consistence. Microscopically it consisted of more or less typical glandular thyroid tissue divided into lobules by a delicate lowly-cellular fibrous matrix in which blood-vessels and lymphatics were a prominent feature (Fig. 2). The colloidal material was confined to the acini which were lined throughout by cuboid epithelium. As a result probably of imperfect absorption many of the glandular spaces were markedly cystic, the specimen resembling in this respect one of the types of goitre (cystic colloid). In addition to colloid matter many of the larger spaces particularly contained extravasated blood.

The operative procedure can be shortly summed up, thus—shell it out as you would an enlarged prostate and then stop the bleeding.

From the literature at my disposal it would seem that Wolf in 1882 at the German Surgical Congress first drew attention to the real nature of these tumors.

Chamisso collected about 18 examples. Others have been recorded by Benjamins, Watson, Leweles.

Seldowitsch saw a myxodema develop after the extirpation of an accessory thyroid tumor at the base of the tongue.

Collins Warren described in the *Journal of the A. M. A.* a case of goitre at the base of the tongue in a woman fifty-two years of age.

Bernays of St. Louis reports a case where the bulk of the tumor was in the substance of the organ.

Butlin records two similar cases in the *Clinical Society's Transactions*, vol. xxiii, p. 118. Schadle, *Journal A. M. A.*, 1899, August 12, removed one from the tongue of a woman aged 25.

REPORT OF A CASE OF SARCOMA OF THE THYROID.

BY EDGAR A. VANDERVEER, M.D.,

OF ALBANY, N. Y.,

Attending Surgeon to the Albany Hospital.

SARCOMA of the thyroid is of such comparatively rare occurrence that the report of the following case, occurring during my surgical service at the Albany Hospital, seems worthy of being placed on record.

The history of the case is that of M. H., aged 70, white, male, born in United States, married, drayman by occupation. He entered hospital complaining of a tumor on the right side of the neck.

Family History.—Father died of pulmonary tuberculosis; mother died of pneumonia; three brothers alive and well. No history of growths of any kind in any of the relatives.

Past History.—Had the ordinary diseases of childhood; had a fever when he was a young man, which lasted two months. Heart, lungs, kidneys, bladder and stomach negative as to history. Appetite good.

Present Illness.—About six years ago noticed a growth in the neck; it began on the right side and appeared to be loose beneath the skin. This gradually grew until it reached around in front, at the same time gradually interfering with the breathing and the voice. It remained quite loose and movable up to the present time.

The size of the tumor may be judged by the accompanying photographs. It had the appearance of a good-sized cocoanut.

After a careful examination of the tumor, a diagnosis of a cyst of the right lobe of the thyroid was made, and operation advised and accepted.

The description of the operation is as follows:

Upon examination patient presents an enlargement of the right side of the neck the size of two large oranges, symmetrical throughout and fairly movable. There is no pain, but some

dyspnea and difficulty in breathing are experienced (see picture). Injection of a 1 per cent. Novocain solution was made along the most prominent part of the tumor for a distance of some seven inches, in a curvilinear manner, from the mastoid to the mid-line of the neck at the sterno-clavicular junction. An incision was made following this line of injection, and superficial muscles were found very much thinned. On the anterior portion of the tumor were nodules seemingly aneurismal in character, from the external appearance. Incision of one of these nodules gave a large amount of hemorrhage. There were many adhesions enclosing the mass, and much severe hemorrhage from the breaking up of the same. The last portion of the tumor to be removed was deep down behind the right clavicle at its inner third. During the operation traction upon the mass gave severe dyspnea. By reason of the depth of this mass at this point it was deemed dangerous to clamp off the many bleeding points at such a depth, so gauze packing was utilized, as well as one gauze strip in the upper angle of the wound. The wound was then closed with chromicized catgut, and the usual dry dressing applied. At one stage of the operation it became necessary to give chloroform and oxygen for a few moments because of the pain experienced in pulling up on the tumor. Further than this the whole operation was performed satisfactorily under local anæsthesia.

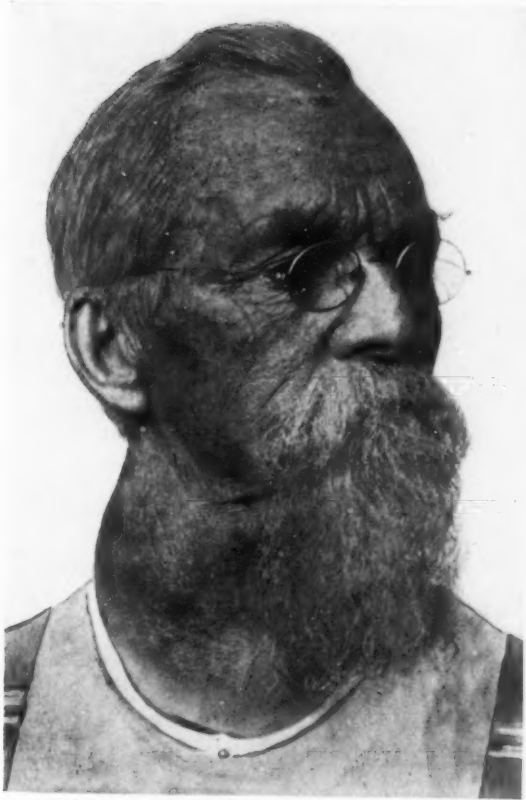
Patient rallied well from the operation, the temperature at no time going above 101° . The second day after the operation the pulse reached 120° , but that gradually reached normal, and the patient was allowed to leave the hospital at the end of twenty-one days, with the wound thoroughly healed, breathing excellent and voice firm and vigorous.

The report from the Laboratory was that of fibro sarcoma of the thyroid gland.

The literature on the subject of growths of the thyroid is fairly abundant, but at no time have I been able to obtain a satisfactory article on sarcoma of this gland.

For a man of his age he stood the operation remarkably well. When we consider that he was seventy years old, and had been a man exposed to the elements more or less all his life, and that this tumor was of six years' duration, a speedy recovery from the shock seems remarkable.

FIG. 1.



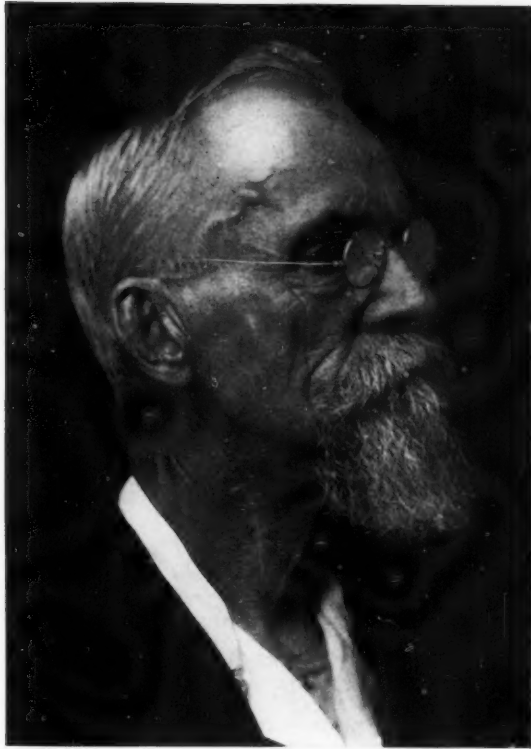
Sarcoma of thyroid. Front view.

FIG. 2.



Sarcoma of thyroid. Lateral view.

FIG. 3.



Sarcoma of thyroid; appearance of neck after excision of the growth.

FIG. 4.



Sarcoma of thyroid; gross appearance of tumor after removal.

NARATH'S MODIFICATION OF TALMA'S OPERATION FOR HEPATIC CIRRHOSIS.

BY EUGENE R. CORSON, M.D.,

OF SAVANNAH, GA.

NARATH'S modification of the Talma operation has not attracted any attention in this country;¹ whether it has been taken up in Germany or not I am also unable to say. Narath's original paper I have not been able to get.² It was first brought to my notice by a short excerpt in the *Medical Record* which reported the results in 11 or 12 cases with a brief description of the operation itself. According to this report the operation was very simple, done under local anæsthesia, and followed by remarkably good results. Through a small incision in the mid line below the ensiform cartilage the peritoneum is opened, a bunch of omentum is picked up, drawn out, and tucked under the skin, and stitched in place with a few catgut stitches. The incision in the abdomen is carefully sewed around the base of the omental mass, sufficient to close the abdomen, yet avoiding any constriction of the omental tissue itself. The abdomen is carefully closed in layers as is now the custom. The operator, as he sees fit, may do a one-sided operation, or he may pick up a second bunch of the omentum and stitch it in on the opposite side, should he think it necessary to increase the area of transplantation. According to Narath, the subcutaneous veins become prominent in a week, and the relief to the obstructed portal circulation is at once apparent. He reports no case of hernia, and writes enthusiastically of his method.

There are two points in this operation which impressed

¹ The only allusion to it I have seen, occurred at a discussion on the Talma operation at the New York Academy of Medicine, Nov. 16, 1905, when Dr. Franz J. A. Torec reported a successful case which was practically Narath's operation.

² *Über subcutane Verlagerung des Omentum*, Zentralbl. f. Chir. No. 32.

me favorably, namely, its simplicity, and most important of all, the direct implantation of the omentum subcutaneously, for nature seems best able to perfect a collateral circulation through the superficial veins.

It is only within recent years, comparatively speaking, that anatomists have worked out thoroughly the relationship, the sites of anastomosis, between the portal and systemic circulation. As bearing so vitally upon the problem before us let me briefly summarize the results of modern research on this anatomical point. In a paper by Dr. Rolfe Floyd in the *Medical Record* for July 4, 1903, entitled "The Anatomy of Portal Anastomosis," the whole subject has been most admirably set forth and I shall quote largely from it and reproduce two of his instructive diagrams. There are several points of interest in Dr. Floyd's paper bearing on the subject. He writes: "I have found no record of a case of failure of complete closure of the ductus venosus with a secondary enlargement of this vessel in portal obstruction, and so far as I know, this vessel never supplies a channel of portal anastomosis in the adult." It would be interesting to know if any cases have been reported of the non-obliteration of the ductus venosus. Nature has evidently safeguarded this structure with unusual care, as she does not prove so careful with some other foetal organs. Again, according to our author, there has been some dispute as to the complete obliteration of the umbilical vein. "Sappey, '83, stated that all cases reported as patent umbilical veins, secondarily enlarged and furnishing an anastomotic channel in portal obstruction, were, in truth, not such, but enlarged veins running parallel with the round ligaments, and that the latter structure could always be demonstrated in such cases, in its usual adult condition. Baumgarten, '77, however, had stated that with the microscope he had found a minute central venous canal in the round ligament in fifty-four cases out of sixty, and that this canal became dilated in portal obstruction. Wertheimer, '86, looking into the matter somewhat more deeply, found that the narrowed lumen of the vein was completely occluded shortly after birth by a plug of connective tissue, and

that subsequently, within a year or two, in the majority of his cases, nine out of sixteen, a venule appeared in this central plug which communicated with the small veins coursing on the surface of the round ligament. This central venule penetrated the round ligament from its attachment to the abdominal wall to its junction with the still patent region within the liver. This venule was occasionally double, or broken into a fine, venous net. At the same time he reported three cases of portal obstruction, in one of which the round ligament was not enlarged, and contained no central venule, while in the other two there was a distinct enlargement of the round ligament as a whole, and an increase of the central channel to eight times its usual diameter."

"Thus it appears that in some cases, at least, the umbilical vein may be reclaimed, in this roundabout fashion, to its function as a blood vessel, and form a channel of communication between the portal and systemic veins."

Dr. Floyd mentions four normal sites of anastomosis between the portal and systemic veins in the adult.³

"1. Anastomosis at the lower end of the œsophagus. The coronary vein of the stomach receives radicles from the lower end of the œsophagus, which lie chiefly between the mucous and muscular layers of its wall. The same region is also drained by veins which pass to the phrenic veins, and so to the inferior cava, and by veins which unite to form the inferior œsophageal tributaries of the azygos veins and so enter the superior cava (Fig. 1.1). In the body which I dissected in connection with this paper, the two most evident veins in this region were the coronary vein, and a lower œsophageal vein which passed to the vena azygos major.

"2. Rectal anastomosis. The hemorrhoidal venous plexus lies between the muscular and mucous coats of the rectum. It is drained above by tributaries of the inferior mesenteric vein of the portal system, laterally, by rectal veins which enter the internal iliacs and, below, by the inferior hemorrhoidal veins which pass to the internal pudic veins, and so again to the

³ Gray gives practically the same sites of anastomosis.

internal iliacs (Fig. 1.2). This plexus thus constitutes a pretty free anastomosis between the portal and systemic veins. In the

FIG. 1.

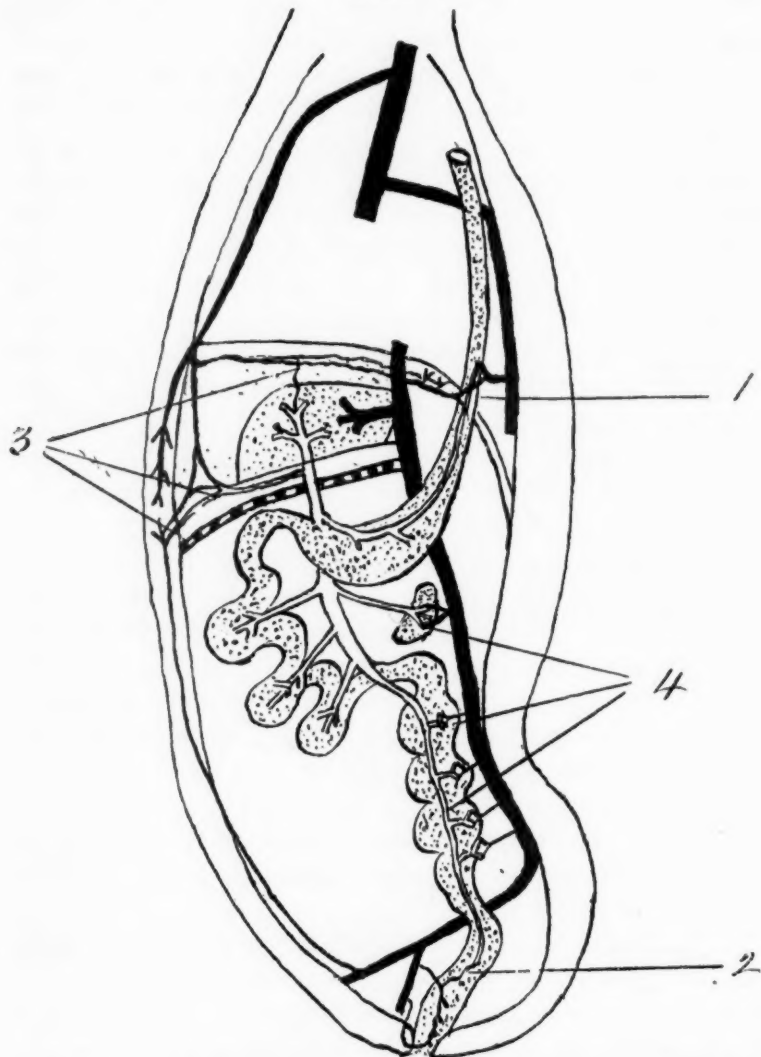


Diagram to show the sites of portal anastomosis in the adult; the portal system of veins is shown in outline, the systemic veins in black, the round ligament and ductus venosus in broken line; the viscera are indicated by thick dotting, the suspensory ligament by sparse dotting (Copied from Rolfe Floyd, *Medical Record*, July 4th, 1903).

body which I examined injection mass, thrown into the internal iliac, passed into the inferior mesenteric vein, establishing the fact of the anastomosis in that case beyond question.

"3. The accessory portal veins of Sappey. These are veins in the suspensory ligament of the liver, which establish anastomosis between the portal system on the one hand and the veins of the anterior abdominal wall and of the diaphragm on the other (Fig. 1.3). Those which pass up to the phrenic veins take origin within the liver substance from small portal branches, not from the portal trunk, and emerge from the upper surface of the organ to enter the suspensory ligament. Those which pass forward, on the other hand, root in the portal vein in the transverse fissure. Some of these course along the surface of the round ligament, while others lie higher up in the suspensory ligament. These veins regularly connect with the veins of the anterior abdominal wall. The situation of one of these veins in the centre of the round ligament has already been referred to. In the body which I examined they united, while still in the suspensory ligament, with vessels derived from the internal mammary and deep epigastric veins.

"4. The retroperitoneal veins. The duodenum, the pancreas, and part of the colon lie immediately against the posterior abdominal parietes, and, just as in any other continuous mass of tissue in the body, the veins of these viscera, belonging to the portal system, become more or less continuous with the systemic veins of the parietes (Fig. 1.4)."

These four sites are shown in Fig. 1. In the second figure I copy from Dr. Floyd's paper are shown the chief veins of the anterior abdominal wall which are of interest to us in the collateral circulation of portal obstruction. He enumerates the following branches: (1) Deep epigastrics, tributaries of the external iliac; (2) superficial epigastrics, tributaries of the femorals through the saphenous; (3) superior epigastrics, tributaries of the internal mammaries; (4) intercostal veins of the sixth to the ninth spaces, tributaries of the azygos veins.

These valuable researches of Dr. Floyd point to the accessory portal veins of Sappey, uniting freely as they do with the

anterior abdominal veins, as the chief site where nature is enabled to form a collateral circulation. Again, they seem to show that these accessory portal veins which pass forward should be more efficient for the new channel than those which pass up to the phrenic veins, as the former "root in the portal

FIG. 2.

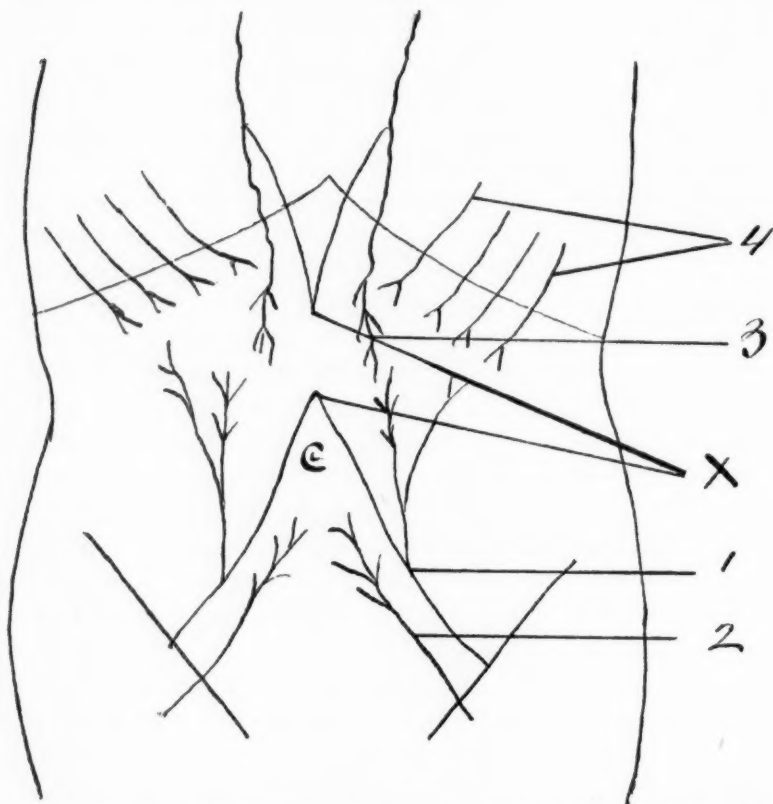


Diagram of the veins of the anterior abdominal wall; 1, deep epigastric; 2, superficial epigastric; 3, superior epigastric; 4, intercostal; X, branches from the internal mammary and deep epigastric veins which pass into the suspensory ligament (Copied from Rolfe Floyd, *Medical Record*, July 4th, 1903).

vein in the transverse fissure," while the latter "take origin from within the liver substance from small portal branches, not from the portal trunk." Therefore, uniting the superior surface of the liver to the opposing surface of the diaphragm, as

is done in the Talma operation, is not so efficient as uniting the omentum to the anterior abdominal wall, either by stitching it to the peritoneum, or preferably, as I believe, by its subcutaneous insertion, as in the Narath operation. In this way, by bringing the portal vessels of the omentum in direct contact with the tissues in which these superficial abdominal veins lie, a more direct collateral circulation is established. That there should be an evident enlargement of the superficial abdominal veins in a week after the operation shows how quickly nature has availed herself of this new channel.

To show nature's wonderful resources in the way of a collateral circulation by the superficial abdominal veins, we can find no more signal example than in the case of obliteration of the superior vena cava, so minutely described by Professor Osler in the *Bulletin of the Johns Hopkins Hospital* for July 1903. The paper is well worth reading in connection with our present subject. In this case nature was enabled to carry the venous blood from both arms and the head back to the heart through the superficial veins of the chest and abdomen, reaching the right auricle by the azygos and the inferior vena cava.

While I have but one case of Narath's operation to report the signal success I obtained under the most adverse conditions prompts me to publish it in the hope that the operation may have the extended trial I think it deserves. I first saw the patient in question in the fall of 1904 and operated in January, 1905, and as he writes me of continued improvement up to the present time, eighteen months after the operation, I feel that a sufficient length of time has elapsed to show the value of the procedure.

G. M., white, single, *aet.* 43, shows a good family history. He had a severe typhoid fever when 22 years old which nearly resulted in his death. When 36 years of age in Cuba, in the Spanish-American war, he had dysentery, malaria, yellow fever, and ascites. Under the treatment of the army surgeon he apparently recovered. The ascites did not return till June, 1904. Patient has had gonorrhœa several times; he has used intoxicating

liquors in moderation up to the time he went to Cuba when he used them to great excess. In September, 1904, he had a Hunterian sore, followed in six weeks by pronounced secondaries: all the typical symptoms, roseola, a papular syphilid, sore throat, fever, bone pains, and alopecia. I saw the patient first early in October before the secondaries appeared. He had pronounced ascites at the time; his face had the characteristic drawn expression of abdominal distension; he was thin and somewhat jaundiced; the urine showed a trace of albumin; altogether he presented a clinical picture well nigh hopeless. I ordered him into the hospital. I lost sight of him till December when he was brought to my notice in the ward, with some secondaries still out on him, and under full specific treatment. On December 29th he was tapped by the house-physician who removed two gallons of fluid. This rapidly re-accumulated. I operated first on January 4th, under general anæsthesia. I made a median incision about four inches long below the ensiform cartilage and let out nearly two gallons of fluid. Palpating the surfaces of the liver I made out a cirrhosis in its most advanced stage. Without exaggerating I can only liken the sensation to the examining hand of a bag full of marbles, so pronounced was the bosselation, if I may coin a word. The gall bladder seemed normal. I tucked a bunch of omentum under the skin on the right side, spreading it out as much as possible. I carefully sewed around the base of the omental mass and closed the abdomen in layers. There was no reaction from the operation. At the end of a week there was a distinct increase in the size of the abdominal veins, as described by Narath. The abdomen, however, filled up rapidly again, and on January 30th I repeated the operation, letting out an amount of fluid quite equal to the previous tapping. This time I tucked a bunch of omentum under the skin on the left side just below the first omental graft and closing the abdomen as before.

After this second operation the patient almost immediately expressed himself as feeling better. Though there was an evident re-accumulation of fluid, it was neither so rapid nor so extensive. He was up and about walking in the hospital grounds. An improvement was evident to all who were watching the case. He was not tapped again. He shortly left for the National Soldiers' Home in Tennessee where he was offered a home, and he has

remained there ever since. He has regularly written me short accounts of himself, all indicating a gradual improvement.

In a letter dated July 8, 1907, he writes: "My abdomen is still swollen some, but the surgeon here says it is from gas, and there is no water or very little in the stomach. My strength has improved a great deal in the last three or four months, and I sometimes take walks of two or three miles distance. After exercising a good deal during the day my ankles swell a little, but go down again before morning. My appetite is very good, although my food consists mostly of milk and toast, as this seems to agree with me best. I sleep extra well, except I dream a good deal.⁴ Where the incisions were made by the operation I suppose I am ruptured there, as they extend out about two inches when I am not using a bandage; I wear this bandage all the time. The veins on my stomach are very prominent, and I am short of breath when going up grade. The greatest trouble I have is in trying to climb upon something about three or four feet high, as a box. My bowels do not act regularly and I have to take a good deal of purgative medicine every day or two. When I press upon the outside of the incisions on my abdomen it feels sore inside. . . . My weight is 151 pounds."

Considering the condition this man was in at the time of operation, and complicated, too, by syphilis in its secondary stage, the result obtained by this operation seems to me remarkable. In the few cases I have seen reported of successful Talma operations the patients have undergone repeated tapplings until the collateral circulation was equal to the emergency. In this case the collateral circulation seemed to have been established quite rapidly. Whether there is a real hernia in addition to this double epiplocele I, of course, cannot say without examining my patient. Before he left the hospital the epiplocele was very evident on inspection, probably rising a half inch above the skin. It is possible that the enlargement in the omental vessels may be sufficient to account for the increase in the protuberance.

The success attained in this advanced case would point to

⁴Is this the result of the brain getting portal blood which has not been cleared by passage through the liver?

a much greater success for the operation if done in the beginning of the cirrhotic process. It would be interesting to know if there has been any improvement in the condition of the liver, a reduction in the fibrosis. I am inclined to think that nature has accomplished something in this direction. We do see it in other forms of fibrous proliferation.

The Talma operation has a considerable mortality, never less in all cases than 10 per cent., and where the cirrhosis is advanced this mortality is greater. I think it is a mistake to leave any open drainage for the ascitic fluid, as infection is bound to occur sooner or later. The mortality of Narath's operation must be little or nothing. As the majority of these cases do not get to the surgeon before the disease has reached an advanced stage and any serious operation is very risky, the simpler operation of Narath's offers the best chance for help, even with the inconvenience of an epiplocele and a possible hernia. The chances of this latter complication do not seem to be great. The position of the epiplocele is not favorable for hernia, and the transplanted omentum must act as a plug against the protrusion of the gut.

ACUTE PANCREATITIS.

WITH REPORT OF TWO CASES.

BY WALTER A. JAYNE, M.D.,

OF DENVER, COLORADO,

Professor of Gynecology and Abdominal Surgery, Medical Department, University of Denver.

It was in 1889 that Dr. Reginald Fitz published his monograph on acute pancreatitis, and forcibly calling the attention of the medical profession to its various forms, gave that masterful description which has since been the classic to which we turn when we study this disease. He told us at that time that it occurred more frequently than was generally thought, and ten years later Mr. Mayo Robson made the same statement as the result of his large surgical experience. Time has proven that these assertions were amply justified. In recent years pancreatitis has excited an increasing interest. Many articles of the greatest value appearing in our medical journals have made us more familiar with its manifestations, and the more frequent reports of cases observed and treated surgically suggest that instead of being overlooked it is coming to be more commonly recognized.

The location of the pancreas is obscure and the difficulties of diagnosis from the symptoms alone are so great that the presence of pancreatitis is seldom determined in advance of operation or a demonstration at the dead house table. The violent, acute forms are not so common as to force themselves upon the watchfulness of the general practitioner. We must believe that milder forms occur with considerable frequency, and subsiding without notable incident, or followed, possibly, by a moderate and late induration, the true nature of the attack escapes recognition and is ascribed, most plausibly, to acute indigestion, gall-stone colic, or if prolonged, to "gastritis."

We know that the pancreas is one of the most important organs concerned in digestion, and that the large proportion of our food is dependent upon the chemical action of its secre-

tions for preparation for successful assimilation and the proper nutrition of our bodies. Physiologists tell us that normally the pancreas produces certain enzymes,—the amylolyptic, the lipolyptic and the proteolyptic,—each varying in amount, responding to demand, and adapted to the breaking up of the class of food indicated by the name, and, that it controls the carbohydrate metabolism, whether directly by some internal secretion or otherwise is not yet clear.

Since the secretions of the pancreas take so prominent a part in the chemistry of digestion, it has been confidently expected that the excretions, upon careful analysis, would yield positive evidences of the interference with or interruption of its functions, we have assumed to be incident to disease, whether acute or chronic, and give definite guides to diagnosis. Notwithstanding diligent search such evidences have yet proved so elusive, inconstant and uncertain as to afford us no sure guide when most urgently needed, and we have helpful suggestions only, occasionally present in the later stages of acute disease, more frequently in the chronic and malignant forms. In acute pancreatitis, therefore, and too often in chronic induration, cystic and cancerous disease of the pancreas we must still depend upon the clinical manifestations at the bedside for our diagnosis, unless indeed an exploratory incision gives us the demonstration. We should be watchful, however, for such chemical or microscopical evidences as may occasionally occur. If we may assume that the pancreas is incapacitated for all function at once upon the onset of an acute inflammation, the explanation of the absence of corresponding indications in the excretions may be found in the fact that the contents of the stomach are promptly ejected, and no food is taken for some days at best, not until, by happy chance, convalescence is in some degree established. A further reason may be, as Fitz has stated, that "the functions of the pancreas are not the exclusive property of this gland, but are possessed to a greater or less extent by other structures and other agencies," and the evidences are obscured.

During the past ten years surgery has extended its field

of activity to the upper abdominal cavity, and the opportunity thus afforded to study the diseases of this region in place, instead of in the dead house only, has assisted in shedding valuable light on the ever varying symptom complex these diseases present for our analysis, and has materially advanced our diagnostic ability. This experience has demonstrated that diseases of the pancreas are neither so very rare or necessarily unrecognizable, and that with better acquaintance acute pancreatitis may often be determined without exploratory incision.

The subject is not fully understood, and the diagnostic indications are seldom clear. Many problems, theoretical and practical, remain to be solved, and each case observed is therefore of especial interest. With the hope of aiding in the further elucidation of acute pancreatitis I beg to report two cases which happen to have come under my care during the past year.

CASE I. Mrs. —, aged 33, of good physique, weight 135 pounds, had never had any illness of moment. Previous health excellent except that for two months prior to her present illness she had had slight "intestinal indigestion," characterized by epigastric discomfort and distention after eating, for which she had been under treatment. August 22nd, feeling particularly well on rising, she was seized with a sharp, smarting, agonizing pain at the epigastrium as she was entering her bath, prostrating her to the floor, and followed shortly by nausea and vomiting. Dr. H. W. Hoagland, of Colorado Springs, saw her about an hour later. She was suffering severely, face bluish, pulse 82, temperature normal, no shock, abdomen tender and slightly tympanitic. The pain was temporarily relieved by morphia with atropia, but later returned, being dull and persistent, accompanied by nausea and vomiting. Evening pulse 84, temperature 99.5. The next day, pulse 76, temperature normal, expression good. The third day, morning pulse 100, temperature 99.6. The nausea and vomiting had persisted, and notwithstanding repeated cathartics and enemas the bowels had not moved. During the afternoon she became worse, pulse 120, temperature 100, abdomen greatly distended, tympanitic and tender.

With Dr. Hoagland I saw her sixty-three hours after the

attack. The face was grayish, expression anxious, tongue coated, pulse 130, temperature 100.5, abdomen large, tympanitic and very sensitive, especially at the epigastrium and extending to the left hypochondrium, with resistance and suspicion of a deep-seated mass. The diagnosis lay between acute obstruction of the bowels from unknown cause, acute pancreatitis, and perforating ulcer of the stomach or duodenum. The known previous history did not suggest ulcer and perforation was therefore considered improbable. The condition was grave, peritonitis impending if not already present, and immediate exploratory incision was decided upon. While preparations for operation were being made the bowels moved voluntarily and copiously and again an hour later after enema. The discharge was liquid, ashen gray, offensive, and to the naked eye contained no fat or undigested food. The patient was so greatly relieved that operation was not advisable. The nature of the attack was left in question, but as acute pancreatitis remained as the only probable and sufficient explanation she was watched for confirmation of this tentative diagnosis.

Although relieved of urgent symptoms the patient was left exhausted, lethargic, and confined to bed with an undefined discomfort at the epigastrium, tongue furred and disinclination for all food. For ten days her condition remained about stationary, pulse from 96 to 120, temperature normal or subnormal, abdomen large, tympanitic, sensitive, resistant and palpation unsatisfactory but with increasing suspicion of a mass. From the eleventh to the sixteenth day the evening temperature ran from 99 to 99.4. On the thirteenth day an embryo of one month was discharged. From the sixteenth to the nineteenth day the evening temperature varied from 100.4 to 101. The abdomen was softer and though still distended an epigastric mass could be distinctly felt. Deep-seated, it appeared to be about the size of a flattened orange. Abruptly terminating an inch to the right of the median line it seemingly extended beneath the ribs on the left, but was separated from the liver by a distinct space. During the next four days the temperature declined each evening until it reached 99.2, pulse averaging 100, and the patient became stronger and brighter, with an improving appetite. On the evening of the twenty-fifth day she was seized with a chill followed by vomiting, pulse 120, temperature 100.4. The next morning the temperature was above 99 for the first time, registering 101.5. Examination showed the

mass to have increased in size. It was pushing to the right and upward to the liver, and was very tender. On the twelfth day a blood count showed a leucocytosis of 11,000; the twenty-second day, 15,000; and on the twenty-seventh day, 30,000, no differential count being made. Examination of urine and feces had been negative, the urine now showed positive reaction for acetone and diacetic acid.

After consultation, in which Drs. Gardiner of Colorado Springs, Isaac Adler of New York, Freeman and Powers of Denver joined, the diagnosis of abscess of the pancreas was concurred in and an exploratory incision was determined upon.

Operation September 19th, four weeks from date of attack, Drs. Freeman and Powers assisting. Incision at the epigastrium, five inches in length, through the right rectus, one inch from its inner border. On opening the abdomen disseminated areas of fat necrosis were found in the omentum. The mass, five inches in diameter, lay behind the stomach, extended about three inches to the right of the median line, approached the liver and was attached to all adjacent structures by adhesions. The gall-bladder and common duct were uncovered, as far as was deemed safe without opening the abscess, but sufficiently to demonstrate their healthy condition and the absence of gall stones. The peritoneal cavity being protected by gauze, the gastro-colic omentum was opened and by blunt dissection, in a direction upward and backward, at the depth of a finger's length a pocket containing about eight ounces of thin, grayish pus was discharged, and further exploration opened two smaller subsidiary pockets in the substance of the gland. The pus cavity having been wiped dry, a large (five-eighths inch) rubber tube protected by gauze was passed to the bottom of the abscess and fixed by suture, packing removed, and the upper two-thirds of the incision closed by layer sutures. But little shock followed and the patient improved from the first, making an uneventful recovery until the sixth week. Dr. W. C. Mitchell reported the pus taken at operation as giving a pure culture of the colon bacillus.

She was placed on the right side to favor drainage which for the first four days was very copious, saturating the large dressings in a few hours, and then became less purulent, diminished in quantity and at the end of a week it had become a free discharge of a thin, clear, watery, alkaline fluid, of sweetish odor, evidently

pure pancreatic juice. Wherever the discharge came in contact with the skin it caused a sharp dermatitis, and the wound became red, swollen and appeared about to suppurate, but on the removal of the sutures on the sixth day complete primary union had taken place. Repeated enemas of a solution of sodium bicarbonate were given for several days following the operation on account of the acetone and diacetic acid in the urine, which finally disappeared on the tenth day. The granulations, seemingly stimulated by the pancreatic juice, rapidly filled the wound which was reduced to a narrow fistulous track, and on the fourteenth day, the discharge no longer containing pus, the tube was removed. The discharge continued free until the night of the twenty-first day after operation when it abruptly ceased and the next morning the wound was permanently closed.

During convalescence the diet, consisting of broths, fowl, meats and toast, was generally well taken care of, occasionally, however, meat fibres appeared in the stools. The strength returned steadily and by the sixth week she was about the house and driving out. Examination showed the scar sound, abdomen soft, no tympanites, no tenderness. Little or no induration at the head of the pancreas could be felt on deep palpation, though the abdominal wall was attached to its location.

After unusual fatigue the previous afternoon, at ten o'clock of the fortieth day following operation, a light breakfast having been taken, she was seized while still in bed with a dull aching and later a smarting pain at the epigastrium, with nausea, increasing in severity during the afternoon and evening. At 4 P.M. the pain was located under the cicatrix and described as of the same character as the original pain. The facies were good, pulse and temperature normal. Through the lax abdominal walls immediately beneath the scar at the location of the head of the pancreas a firm, tender mass, about the size of a small flattened orange could be readily palpated. An enema brought away some feces with undigested food (meat and peas) eaten the previous day. During the evening she vomited, the pain became severe and three hypodermics of codeia and morphia were required for relief. The following day the pain though present was bearable, nausea persisted and large quantities of bile were vomited and the mass was decidedly larger and very sensitive. By evening the pulse was 120, vomiting persistent, and the abdomen was becoming dis-

tended and tympanitic. Repeated enemas had no result until at midnight when the bowels moved freely giving prompt and final relief. The following day she was again convalescent but the enlargement of the head of the pancreas diminished slowly and it was three weeks before it could no longer be felt. Five weeks later she had an attack of epigastric pain of similar character, lasting twenty-four hours but without nausea, and relieved by continuous warm applications. She was not seen by a physician at this time. There have since been no symptoms referable to digestion or the pancreas, and the general health has remained excellent.

CASE II.—Mrs. —, aged 65, never had an illness, robust and in good health, weight 170 pounds. At 10.30 A.M. February 10th, after an unusually hearty breakfast she was seized with vomiting, followed immediately by a sharp pain under the right shoulder blade, passing rapidly to the epigastrium. Dr. H. T. Pershing saw her a few moments later and making a diagnosis of gall stone colic gave a hypodermic of morphia with atropia. The pain was relieved but returned after a few hours, continued during the night, and becoming severe toward morning another hypodermic was given. She was referred to me and at noon the pulse was 90, temperature normal, no pain, nausea, and slight tenderness at the epigastrium. After a restless night she complained of gastric distress, nausea, occasional vomiting, thirst, no pain. Tongue dry, coated, pulse 120 and quick, temperature 100, epigastrium slightly distended, resistant, sensitive to pressure and on deep palpation a small, firm, flattened mass could be felt at the location of the head of the pancreas. The following day the vomiting was persistent, nourishment by mouth was supplemented by salt solution and nutrient enemas. Conjunctival but no cutaneous jaundice. The fifth day she was worse, general restlessness, gastric distress, thirst, nausea and vomiting. Tongue furred and dry, pulse 116, epigastric distention and sensitiveness increased, mass distinctly larger. Urine of yesterday and to-day examined by Dr. W. C. Mitchell who reported: color reddish, specific gravity 1033, acid, no albumen, sugar, pentose, arabinose, indican, Cammidge's crystals (*Surgery, Gynecology and Obstetrics*, September, 1906), or fat splitting ferment (Opie, *Bulletin of J. H. Hospital*, May, 1902), diazo negative, bile pigments positive. Blood count by Dr. J. C. Todd, reds 4,000,000, slight poikilo-

cytosis, leucocytosis 16,800, differential count; lymphocytes 8.8, transitional forms 6, polymorphonuclears 85, eosinophiles 0.2 per cent. On the morning of the seventh day she was seized with a lancinating pain at the margin of the left ribs, interfering with breathing, and of diaphragmatic origin, complained of epigastric fulness and weight which made lying on the back uncomfortable and movement in bed difficult. Tongue coated and dry, nausea but no vomiting, nutrient enemas stopped, pulse at noon 128, temperature 100.4. Epigastrium prominent, resistant and the mass as large as a medium sized grape fruit readily felt and very tender. In consultation Dr. Leonard Freeman concurred in the diagnosis of acute pancreatitis with possible commencing pus formation. Dr. Todd reported on the blood taken at the same time; slight poikilocytosis, leucocytosis 14,500, differential; lymphocytes 16.5, transitional forms 8.2, polymorphonuclears 74.5, eosinophiles 0.8 per cent., a suggested improvement not corresponding to the clinical evidence. Two days later her condition was improved, though gastric weight and discomfort continued, nausea had ceased, pulse 110, mass unchanged. Blood count, slight poikilocytosis, leucocytosis 13,500, differential; lymphocytes 14, transitional forms 6, polymorphonuclears 79, eosinophiles 0.75, mast cells 0.25 per cent. Urine, trace of albumen, few hyaline casts, otherwise negative. Twelfth day, patient improving, taking liquid nourishment well, still complains of weight at epigastrium; abdomen softer, mass firm, less tender, somewhat smaller, pulse 110. Blood count, slight poikilocytosis, leucocytosis 9,500, differential; lymphocytes 17.2, transitional forms 6, polymorphonuclears 76.4, eosinophiles 0.4, mast cells 0.2 per cent. Urine faint trace of albumen, otherwise negative. Examination of feces by naked eye, negative until convalescence, when meat fibres were occasionally found. The temperature throughout varied very little, ranging from 99 to 100.4. It reached 100 on the morning of the third day, and 99.8 to 100.4 on the evenings of the fifth, sixth, seventh and eighth days.

From this time the patient made a slow but uninterrupted recovery. When she passed from observation six weeks after the beginning of the illness she was anæmic, feeble and just able to travel. Digestion good on a diet restricted to fish, meats, fowl, eggs and toast. The head of the pancreas was still easily mapped out by deep palpation as a flat, hard mass, lying deep at epigas-

trium and insensitive except on firm pressure. Recent reports state that in August she had an attack of what was diagnosed as gall stone colic while on her way to Carlsbad, from which she promptly recovered, and that her health is slowly becoming re-established.

While it would appear that these cases are fair examples, the one of acute suppurative pancreatitis the other of acute pancreatitis with resolution, they present several features of unusual interest.

Etiology.—Mr. Mayo Robson attributes acute attacks of pancreatitis to the invasion of bacteria, the infection almost always entering through the ducts (*Lancet*, July 28, 1900). Flexner, Opie and others have shown by animal experimentation that bile, gastric juice and other substances act as irritants when thrown into the pancreatic ducts and produce violent and fatal inflammation of the gland. (Transactions of the Congress of American Physicians and Surgeons, vol. vi.) We know from clinical observations that pancreatitis, both acute and chronic, is often associated with cholelithiasis. Opie has apparently demonstrated at autopsy, following acute pancreatitis in the human subject, that the retrojection of bile had in that case produced the disease, and explaining the mechanism by which it may occur when a gall-stone is lodged in the diverticulum of Vater, urged this as a common cause of this disease. (*Bulletin J. H. Hospital*, 1901, xii, 182.)

After a careful study of the above cases it is believed that we are justified in assuming that they illustrate, as far as may be, both of these theories of causation. Case I was preceded by gastro-intestinal derangement, inflammatory or catarrhal, a condition associated with bacterial activity. There had never been, nor was there during the progress of the case, any jaundice, bile pigment in the urine, or other symptom suggestive of cholelithiasis, and although the pancreatic portion of the common duct only was not examined at the operation, the remainder of the bile passages were so absolutely normal, as to fairly negative the assumption of the presence of a gall-stone at the diverticulum of Vater. The pus at operation yielded a pure

culture of the colon bacillus. These facts point sharply to an ascending infection from the duodenum.

In the second case we have positive evidences of disturbance in the bile passages; the primary pain was typical of gall-stone colic; bile pigments in the urine and the jaundice point to a cholangitis; local evidences of pancreatic involvement did not occur until nearly forty-eight hours later; the pancreas though swelling rapidly to large proportions passed to resolution within the week, all suggestive of an inflammation from a violent irritant, quite possibly from the retrojection of bile into the pancreatic ducts as set forth by Opie.

Clinical Course.—The symptoms in the first case are very closely in accord with the classical descriptions. The sudden, sharp, agonizing pain at the epigastrium; shock more or less pronounced; nausea and vomiting; motor insufficiency of the intestines; distention and tympany; threatening peritonitis; rapid pulse with moderate temperature, form a symptom complex by no means characteristic of acute pancreatitis, which may be presented by several other conditions. Careful physical examination unless made before tympany and rigidity occur, is incomplete or unsatisfactory, and a moderate epigastric tumor may easily escape detection, as was probably the case here. The relief obtained when the bowels finally moved was apparently so complete that for several days the expectation of convalescence appeared fully justified. The lethargy, lack of appetite, furred tongue, continued rapid pulse out of proportion to the temperature or apparent condition, epigastric discomfort without pain, made up the clinical picture until the evening rise of temperature created suspicion of sepsis and abscess formation. About this time the subsidence of tympany and resistance permitted the mapping out of the circumscribed mass, which previously had been indistinct, and thereafter its development could be closely followed until the local indications, taken with the pulse, temperature, and blood count, confirmed the original diagnosis and completed the diagnostic picture for those who had had the opportunity to follow the case.

The subacute attack following so closely upon the demonstration at operation left no question as to its nature. The condition of the pancreas is known to have been negative a few days before, yet within six hours after the apparent inception of the attack, the abdominal walls being lax and deep palpation easy, the gland was found to be very considerably enlarged, firm and not particularly sensitive, leaving the impression that the swelling must have commenced some little time previous to the symptoms, or have taken place with surprising rapidity. It is of interest to note the prompt and complete relief following movement of the bowels, and to compare the almost equal relief similarly obtained on the third day of the original attack, the prompt disappearance of the tenderness within a very few hours, and the slow recession of the pancreatic swelling.

The most notable features of the second case, aside from the original pain, were the general anxiety, epigastric discomfort and weight, thirst, persistent nausea, jaundice, a pulse rapid and quick out of proportion to the temperature and the very rapid and considerable enlargement of the pancreas, the changes in which, as in the relapse in the first case, were watched closely at frequent intervals. The blood count was a most valuable diagnostic and prognostic aid. On the seventh day, when all the clinical signs except the temperature seemed to indicate the imminence of conditions which would prompt operative interference, and possibly the early breaking down of the gland and abscess formation, and thereafter, it gave an accurate forecast of the clinical condition observed forty-eight hours later. During convalescence azotorrhoea occurred in both cases. Visible steatorrhoea occurred only once and then during convalescence from the relapse in the first case, its absence possibly being due to the rigid exclusion of all fats from the dietary.

Diagnosis.—In 1900 Mr. Mayo Robson stated that "although pancreatic disease is without pathognomonic signs, the diagnosis can usually be arrived at by a careful study of the history, mode of onset and the combinations of symptoms and signs." Fitz has said that "acute pancreatitis is to be

suspected when a previously healthy person or a sufferer from occasional attacks of indigestion is suddenly seized with a violent pain in the epigastrium, followed by nausea and collapse, and in the course of twenty-four hours by a circumscribed epigastric swelling, tympanitic or resistant, with slight elevation of temperature," and in 1903 he said in effect that we have no evidence "which gives to the diagnosis more than a variable degree of probability." In Case 1 the combination of the history, character of the original attack, and local signs pointed most clearly to acute pancreatitis after the matter of poisoning, perforative peritonitis, and finally acute obstruction of the bowels, could fairly be eliminated. Continued study of the developments in the case gave corroborative evidence of the diagnosis which was as positive as is possible in internal disease in advance of a demonstration at the operating or autopsy table. The diagnosis of the relapse was practically made by the patient before being seen by a physician.

In the second case the abdominal walls, though thick, were sufficiently lax on the first day to permit of a satisfactory deep palpation and the consequent knowledge of the ordinary local physical condition with the slight tenderness over the head of the pancreas to excite attention, and the later observations at frequent intervals, together with the history and symptoms led to a definite diagnosis. All subsequent events tended only to confirm it, even to the remaining sclerosis, recognized independently by others after her return home.

Treatment.—In the early stages of an acute attack with definite pancreatic enlargement and condition threatening, exploratory incision with drainage of the peri-pancreatic space, with possibly punctures or incision of the organ for the relief of the congestion, has, in a goodly number of cases, been followed by prompt recovery, apparently as a direct result of the treatment. Whether or not such treatment in the first case would have succeeded in averting the further progress of the disease and avoiding the subsequent suppuration we cannot say, but it should be noted that the condition was apparently not at all serious or threatening until the third day, when the bowels had not

moved and peritonitis appeared imminent. Then a voluntary movement of the bowels gave such evident relief that no interference was justified. The strictly medical treatment of this case appears, therefore, to have been eminently wise until the symptoms and the increasing mass pointed with almost unerring certainty to suppuration, when surgical intervention became imperative. At the operation the general cavity was protected, and the use of a large tube proved most satisfactory, efficiently carrying off the profuse irritating discharges and later the pancreatic juice. The protection of the skin from the discharges was most difficult and at times impossible. The treatment of the relapse as of the second case was symptomatic, consisting essentially in relief of pain, moving the bowels by repeated enemata and later nutrient enemata and restriction of the diet.

Conclusion.—The relapse in the first case, and the second case here reported ending in resolution, represent the milder forms of acute pancreatitis rather than the hemorrhagic, gangrenous and suppurative we have heretofore studied. This gland is doubtless pathologically subject to the same varying grades of inflammation as other tissues of the body, from simple congestion to the fulminating often fatal types mentioned. The slighter pathological changes in an organ so deeply and obscurely placed must ever be difficult if not impossible of detection without other aids than we now have. However, with a mind open to the fact that such milder inflammatory processes do occur in the pancreas; appreciating that, in the severer forms at least, as Mayo Robson says, a correct opinion can usually be arrived at, we shall be more alert to its occurrence, become better acquainted with its various clinical manifestations and succeed in recognizing acute, and probably sub-acute, pancreatitis much more frequently than heretofore.

PRIMARY FIBROMYOMATA OF THE BROAD LIGAMENTS.

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INTERLIGAMENTOUS development of fibromatous nodules originating from the uterus are common; but primary interligamentous fibromyomata, with no connection to the uterus either as to origin or development, are rare. So rare are these primary tumors of the broad ligament that for a long time pathologists did not admit their existence; and even yet there is confusion and uncertainty—even amounting to disbelief—in the minds of most operators as to the nature and existence of these tumors. It was thought for a long time that all such tumors originated from the uterus; that the nodule developing within the folds of the broad ligament became pedunculated and then gradually separated from the uterus by a narrowing of the pedicle till the separation was finally complete and the tumor assumed a purely interligamentous position, deriving its blood supply from the uterine and ovarian arteries within the broad ligament. But now, all doubt as to their origin is dispelled from the investigator's mind by a search of the literature on the subject.

Lack of knowledge in regard to these tumors is primarily due to their rarity, comparatively few surgeons ever encountering one, and secondly, to a lack of attention given these growths by the standard text books, the majority of which have nothing at all on this subject, and the rest containing such meager information as to not merit the attention of the busy worker.

Harpel¹ is of the opinion that these tumors are much more common than the few cases reported in literature would seem to indicate, and the writer is strongly of the same opinion, because a number of such tumors of primary origin, occurring associated with myomatous growths of the uterus, are over-

looked because they are regarded as having originated from the uterus, which, in the majority of cases, is probably not true; since, in the first place, it is very questionable whether a tumor originating from the uterus does not always retain sufficient pedicle or connection to the uterus to recognize its uterine origin; in the second place, the etiologic factors, whatever they may be, that cause the myomatous development of the uterus, by analogy at least, should be potent in the broad ligament also, and, as a matter of fact, the larger proportion of these tumors reported are associated with uterine fibromata, thus bearing out the above argument.

It is only in the cases of broad ligament development alone, associated with a perfectly normal uterus, that the primary origin is so obvious as to compel the attention of the surgeon. Such cases are very rare, there occurring only four in the past eleven years in American literature, so that the author feels justified in a rather extensive report of the following case, both because of the natural interest of the case and because it is such a beautiful and unmistakable specimen of primary fibromyoma of the broad ligament, accompanied by a perfectly normal uterus.

CASE REPORT.—Mrs. H., aged 47; married 18 years; two children, aged 17 and 6 respectively; family history good.

Personal History.—Usual diseases of childhood, otherwise always strong and well. Menstruation began at 14; was regularly established, lasting four to five days. She enjoyed perfect health till the birth of her first baby. The labor was long and hard, but delivery was normal. She gave a history of fever after delivery, and a week later she had an abscess in one breast, and later an abscess in the other breast. She was obliged to go to the hospital for treatment and remained there for six weeks. She was fairly well, she states, two months after her baby's birth, but she was obliged to go back to the hospital at the end of five months to be treated over a long period of time for "ulceration of the womb." No operation was performed.

The second pregnancy occurred eight years later. No miscarriages or abortions in the interval. With this second child she

had a normal period of gestation and a normal delivery. Her breasts were again sore, but no abscesses formed. Later she was again troubled with "ulceration of the womb." She was not able to nurse either of her children.

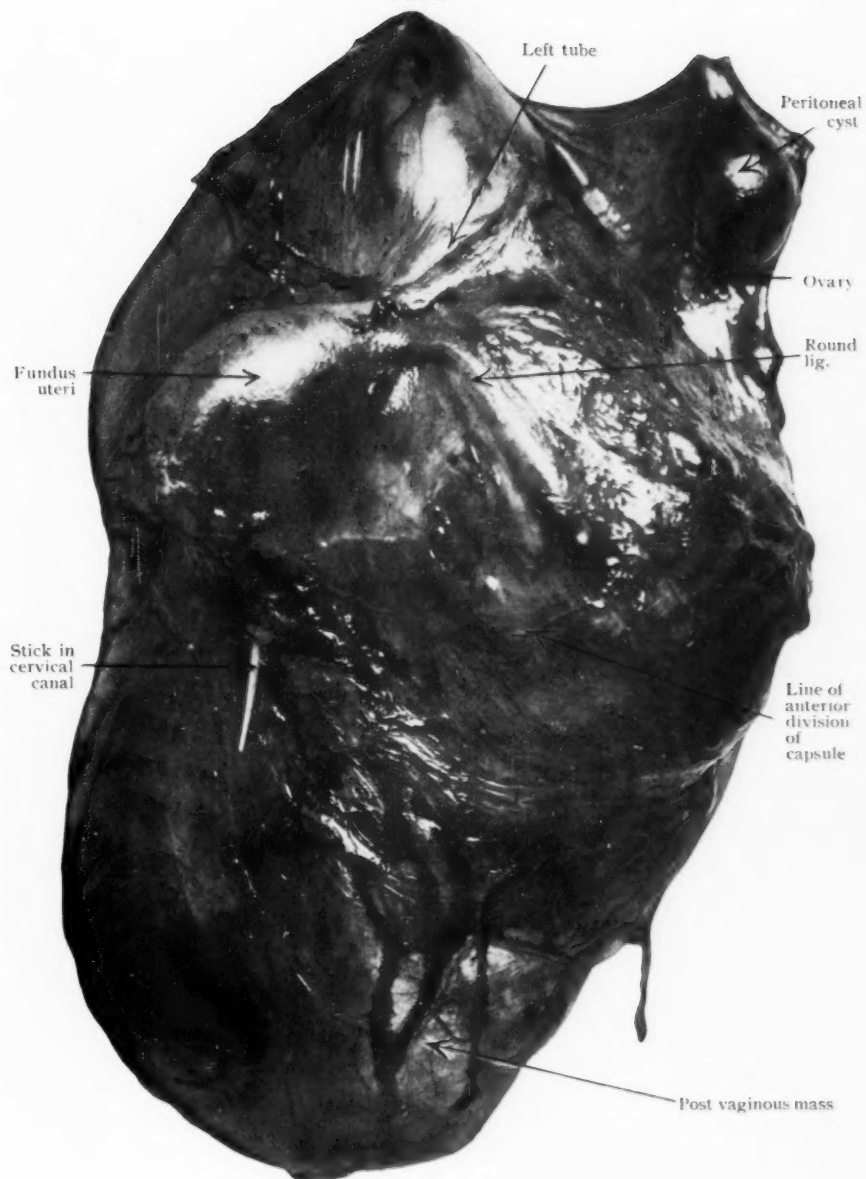
Present History.—About three years ago the patient noticed some "bloating" of the abdomen, but thought nothing of it. About a year ago she felt a "knot" in the right side above the pubes. She suffered no inconvenience from this, however, and did not even consult a physician.

During the past year there has rapidly appeared a "swelling" to the left of the original "knot." Menstruation during this time has been very irregular, both as to time and duration. She has developed pain in the back and radiating pains down the thighs. Frequent micturition has also given her great annoyance during past few months. She has had "stomach trouble" for more than a year past and a great deal of "bloating." Bowels have been regular generally, but lately she has had several attacks of diarrhoea. Appetite generally poor, but at times fair. She has lost about twenty pounds in weight during the past year.

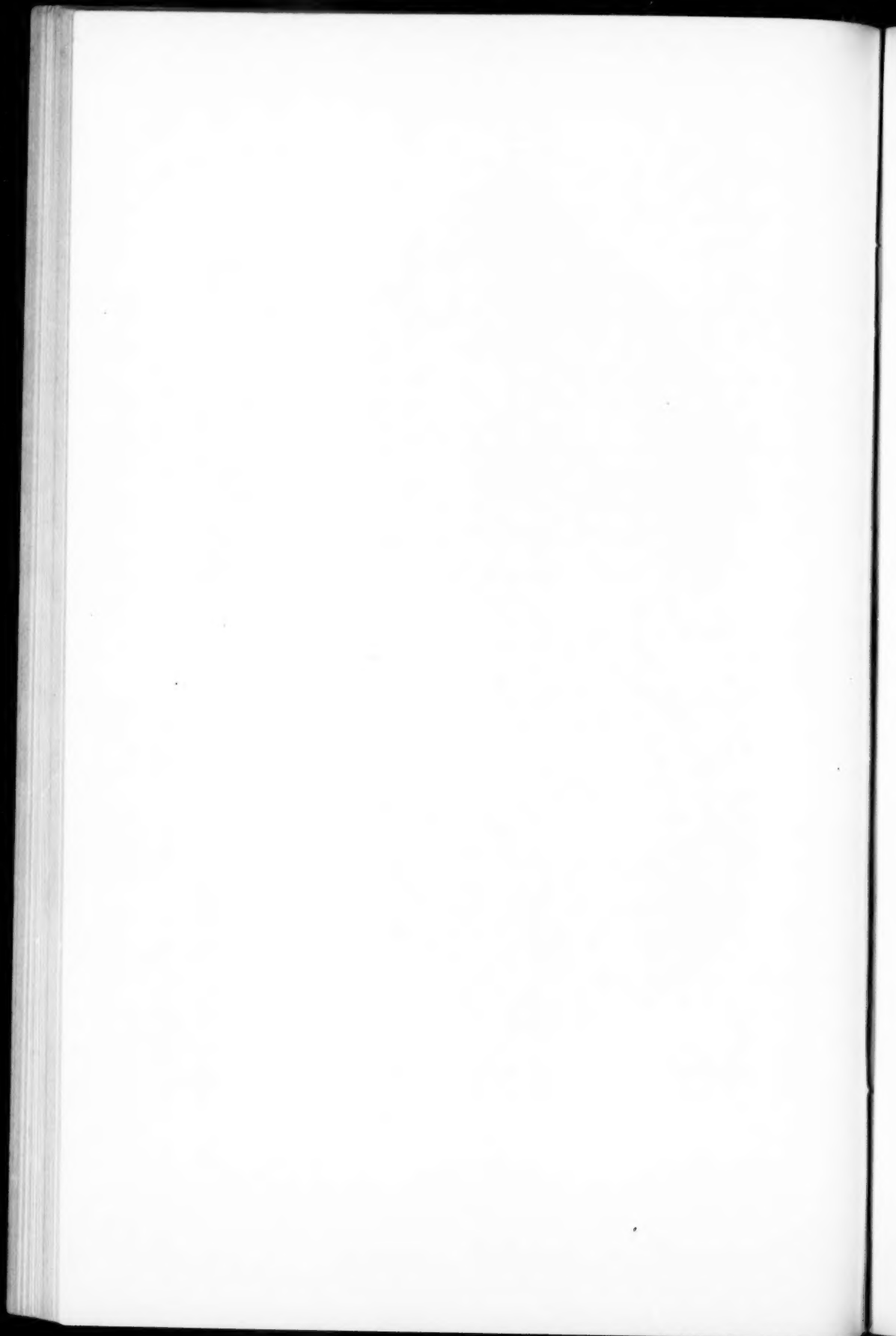
Physical Examination, May 4, 1906.—Patient is about 5 feet 4 inches high. Her skin is very dark and dry. Sunburnt till her face is almost mahogany colored, showing outdoor life. Eyelids and mucous membrane of mouth show only slight apparent anæmia. Patient is thin, but not cachetic. Heart and lungs are normal; pulse 88, temperature normal. The abdomen is considerably distended in the lower portion by a mass which is neither soft nor hard; feels firm but gives beneath the fingers with the resilience of rubber. This mass extends to the umbilicus above, is easily palpated, and fits tightly into the pelvis below. There is no fluctuation, and the surface is smooth and even, except on the right side, about McBurney's point, where there is a nodule about the size of a large pear, which is smooth and slightly movable. There is no other nodule to be felt at any point.

The vagina is pushed up hard against the pubes so that the examining finger passes beneath the pubic bone with difficulty. There is a large resilient mass post vaginam. The whole pelvis is choke full—so much so that the tumor mass cannot be defined except at the ostium vaginæ and backward toward the rectum, which seems to be the lower border of the mass. The cervix is

FIG. 1.



Anterior view of tumor as removed.



felt with difficulty only, high up and to the right, well above the pubic bone. There is no traceable connection between the cervix and the nodule on the tumor above. The cervix has a deep laceration on left side, but is otherwise smooth and very little enlarged. Though the mass in the pelvis is apparently continuous with the tumor above, this cannot be certainly determined, since the whole mass is firmly fixed.

The patient was kept under observation for three or four days before operation, during which time the pulse ran between 86 and 100, but the temperature remained normal.

Diagnosis.—A probable diagnosis of uterine fibroid was made, because the whole mass lay in the median line of the abdomen and not more to one side than to the other, except the nodule, which lay well against the right abdominal wall, making a protrusion of the wall that was easily noticeable to the eye. The resiliency of the tumor suggested a cyst, and its relation to the vagina could only be explained as interligamentous. The nodule to the right, which was firmer than the rest of the tumor, was unquestionably a portion of the tumor, since its base was easily felt. Further the mass in the pelvis was more readily explained as a large myomatous nodule than otherwise, and it was difficult to explain how the nodule above could be that of a cyst.

For these reasons the diagnosis of fibroid of the uterus, as above stated, was made.

Operation, May 7, 1906.—The abdomen was opened and the nodule to the right proved to be the uterus only very slightly enlarged, perfectly normal in appearance and feel (Fig. 1). The right tube and ovary were normal.

The left tube wound over the top of the tumor backward and to the left, and was so changed in appearance as not to be recognized except from its position (Fig. 1). The ovary was all destroyed except a small portion about the size of a hulled almond, imbedded in the capsule of the tumor lying just below a small peritoneal cyst.

The uterus was not pedunculated but sessile in its relation to the tumor, and had the appearance of being imbedded in the tumor; only about three-fourths of the corpus, fundus, and right cornu projected from the tumor.

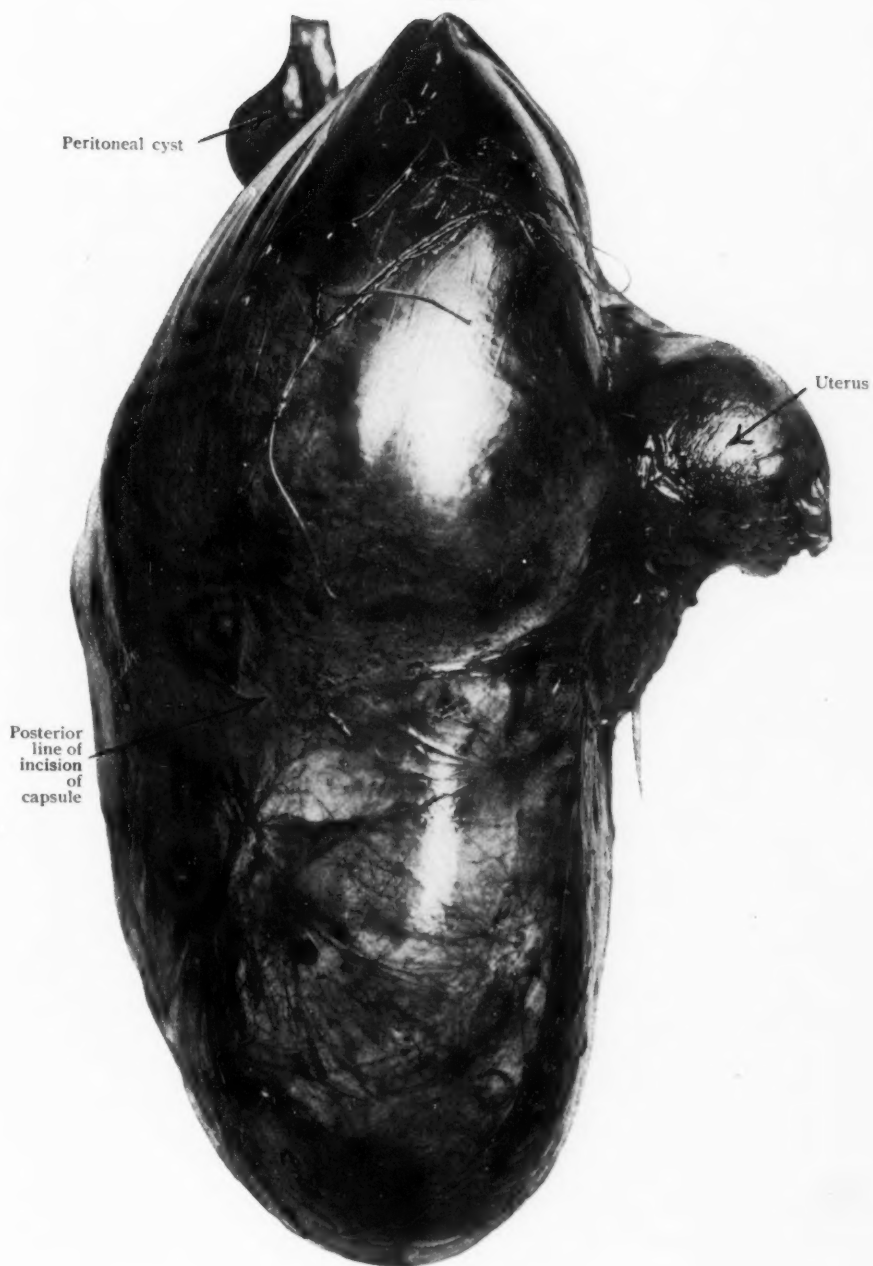
The tumor itself was almost immediately seen to be inter-

ligamentous. This was quickly proven by splitting the ligamentous capsule and enucleating a considerable area of the tumor. The resilience was so great and the feel so much like that of a thick walled cyst, and the probability of a cyst over any other form of interligamentous tumor so great that, without hesitancy (after carefully packing away the intestines with gauze pads) a knife was plunged into the tumor preparatory to inserting a trocar to draw off the fluid. There was a spurt of blood in a stream the size of my finger, clear over my head, showing the great pressure within the tumor. Immediate firm pressure with thumb over the stab controlled the blood sufficiently till the wound in the tumor could be closed with cat gut. The blood was bright red and the spurt like that of a large, severed artery.

Now that the nature (solid) of the tumor was determined, the ovarian vessels on the left were clamped, cut, and the capsule divided before and behind from this point to the junction of cervix and body of uterus. The next step was to clamp the right broad ligament and divide it between clamps down to the uterine artery which was easily exposed and ligated. This was done because the uterus was pushed up so high that it was very accessible. An incision through the peritoneum in front of cervix was then made, joining the uterine end of the incision made through the capsule of the tumor. A similar incision was made behind and the peritoneum pushed down. In front of the cervix the bladder was freed and pushed down with the peritoneum. The cervix, being small, was then clamped and severed. The tumor was then rapidly and easily enucleated by the fingers till it was all free, except where the uterine vessels entered the tumor to the left of the cervix. This attachment was quite large on account of the size of the enormously enlarged vessels. The tumor was then gently lifted up, exposing these vessels and the left ureter. The ureter was isolated and the vessels clamped *en masse* and the tumor cut away. All vessels were then secured with cat gut. A free incision into the vagina was made and the space left by removal of the tumor was drained by strips of gauze with the ends passed into the vagina. The layers of the broad ligament and peritoneum were closed over the gauze packing. The abdomen was then closed, completing the operation.

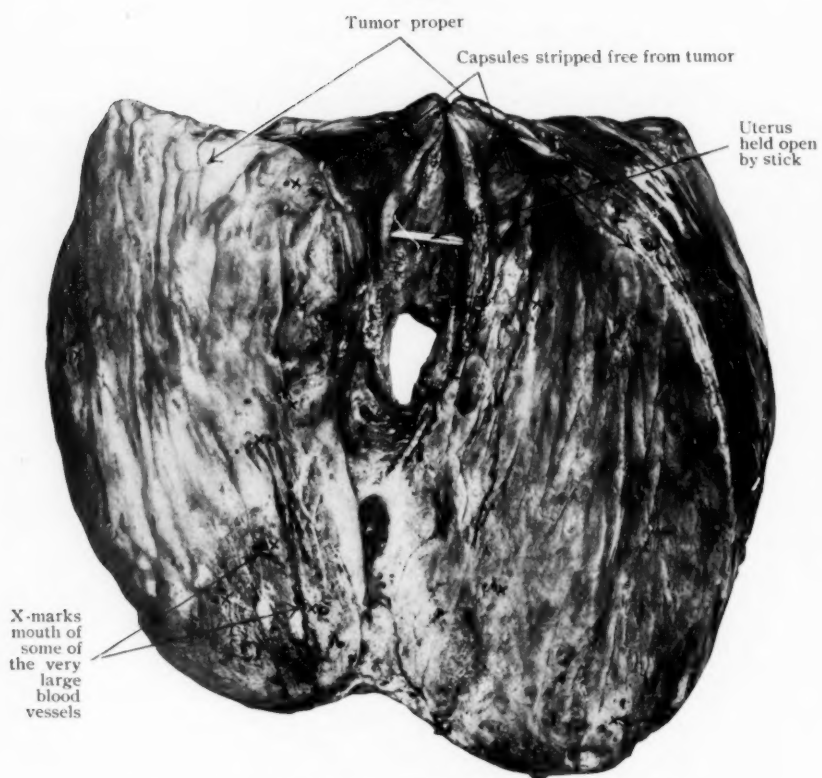
The tumor was when freshly removed, $12\frac{1}{2}$ inches long, 8 inches wide, and 5 inches thick in greatest dimensions. The tumor

FIG. 2.



Side view.

FIG. 3.



Tumor divided through center. Note myriads of blood vessel mouths.

was so vascular as to closely simulate an angioma. The weight of the tumor and uterus was $12\frac{1}{2}$ pounds. The uterus, I am sure, would not weigh over half a pound.

The tumor was photographed a few hours later, just as it was removed. It was then divided in its long axis from the left margin through the center of the tumor into the left cornu of the uterus, down into the body and cervix, then spread open and photographed (figure No. 3). The tumor proved to be a myofibroma, which did not touch the uterus at any point (see figure No. 3), but was entirely independent of a normal uterus and wholly within the folds of the broad ligament.

The tissue was tough to cut, but so full of blood vessels as to be soft and spongy to feel even after all blood was out of its substance.

The patient made an easy but slow recovery on account of long continued drainage per vaginam. The wound healed *primo initio* and the patient was strong enough to make, alone, a long railway trip home at the end of six weeks.

The patient's husband tells me that now, fifteen months after the operation, she weighs 145 pounds and is in excellent health.

Including the author's case, there are only twelve American cases reported, the first of which was by Burnham in 1867. During the past eleven years, beside the author's case, there are four reported cases, which are briefly as follows:

CASE I, HARPEL¹.—Patient 40 years old; married 17 years; no children. Up to seven years ago menstruation was normal and health good. Then menstruation was profuse and enlargement in left pelvic region, size of an orange. Two years ago some pain felt in that region and another attack a year later. A large, firm mass was found to the left and also several smaller myomata in the walls of the uterus. The tumor increased more rapidly from that time and she suffered more than previously from a sense of weight in that region, nervous reflexes, and at times distension of abdomen with gas. Menstruation profuse and then ceased altogether.

Operation.—The myoma and left tube were enclosed in a capsule in which were a number of cysts. A complete hysterectomy was done, leaving only the cervix. The total mass removed weighed $4\frac{3}{4}$ pounds after the contents of the cyst had escaped. The capsule which enclosed the tube and the growth weighed $4\frac{3}{8}$ ounces. The left ovary could not be made out and undoubtedly because entirely cystic and adherent in this capsule. The myoma was situated in the left broad ligament, oval

in shape, $6\frac{1}{2} \times 5$ inches, and weight $3\frac{3}{4}$ pounds. It has a distinct capsule, grayish white in color, firm in texture, with a small area of mucoid degeneration in the center. There are three small cystic cavities deep in the mass and blood vessels on or near the surface. The uterus contained five small myomata in its walls.

CASE II, SHAW².—Miss L., aged 26; first noticed (tumor) enlargement of abdomen about 18 months ago, pain in region of right kidney, profuse and long continued hemorrhage. There was found a tumor somewhat irregular in shape, extending more to the right side than to the left, and upwards to within two inches of the ensiform cartilage. The entire pelvis was filled with the mass and the cervix could not be found. There were well marked pressure symptoms—irritable bladder, constipation, pressure in the rectum, and pain extending down the thighs.

On operation the mass was found to be firmly adherent to the bowels and bladder and involved the right broad ligament. The bladder was drawn over to the left and had a depth of nearly 10 inches. Attempts were made to separate the tumor from the bowels and bladder, but it was impossible to deliver it through the abdominal incision. The uterus, pushed upwards and to the left, seemed healthy, as were also the left ovary and tube. The broad ligament was clamped, ligated in sections close to the uterus and cut. The tumor was then removed as completely as possible with the scissors.

The tumor contained a dark, sanious fluid, the walls being of great thickness. It proved to be a fibroid on microscopical examination.

CASE III, BOVÉE³.—Tumor removed from a spinster of 37 years, who first noticed the growth six years before. She was anæmic from loss of blood and very nervous. The growth was somewhat fixed and extended from low down in the pelvis to the umbilicus. When the abdomen was opened, the mass was found to have developed in the right broad ligament, and was the largest of this variety he had seen. It was removed by Pryor's method of cutting down on one side of uterus and appendage, through the uterine body, clamping vessels as they appeared, and up on the other side. The ureter was first traced downward along the inner side of the growth and was avoided by the sense of sight during the removal of the growth. This operation is the best he knows for large, broad ligament fibroids, and if the location of the ureter is first ascertained, no danger of injuring it will likely occur during the operation.

CASE IV, GOLDSPOHN⁴.—*Æt.* 50; one child 30 years before. The condition within the vagina was very much that of a woman eight months advanced in pregnancy, with a very short, soft, stubby cervix presenting at the middle of the vaginal inlet, and the upper part of the cervix expanded. It appeared to be a uterus with one or more fibroids posteriorly, and also a cystic ovarian tumor in front of it. In making an incision about 4 inches in length, there was beneath the entire length of the incision something that looked very much like an ovarian cyst, very much engorged with veins, and different from a cyst, however, in its consistence, in not being membranous, but thin-walled, of rather doughy, edematous structure. Examining for its attachment, it was evident that

this mass was extraperitoneal, and it was soon demonstrated that it was the bladder; by simply squeezing upon it urine was extruded (several ounces) which could not be obtained by the catheter, which was passed immediately before making the incision. This patient had had retention of urine some three months ago, and at that time required to be catheterized for a week or more; and recently, before coming to the hospital, she was troubled in the same way for nearly two weeks, and she came with a very pronounced cystitis of old standing, which had infiltrated the bladder walls to that extent. The tumor was found to be a lobulated fibroid, two pieces separated completely from each other, the tumor having developed entirely within the right broad ligament. The uterus was not enlarged, as it usually is with a fibroid of this size, because the fibroid lay entirely outside of its walls and therefore she did not have the usual menorrhagia and metrorrhagia—a feature which cast some doubt upon the presence of a fibroid in the diagnosis. In removing the tumor he first ligated the ovarian arteries which were accessible; the bladder was then detached from the tumor anteriorly. But with the tumor in the broad ligament the uterine arteries were wholly inaccessible. He therefore simply incised the capsule of the tumor and enucleated that first. This allowed the whole mass in the region of the cervix to rise higher in the pelvis, and made it comparatively easy to ligate the uterine arteries and to do a supra vaginal amputation.

Pedicated interligamentous tumors are, anatomically speaking, entirely independent of the uterus, and are very rare, only nine cases appearing in the literature, which are briefly as follows:

CASE I, MIKULICZ¹.—Nullipara 22, never menstruated, fibromyoma, 5 kg. in weight; extensive adhesions to omentum and transverse colon, pedicle, having the right ovary attached, was united with the right broad ligament. Tumor tissue highly edematous.

CASE II, SÄNGER².—Girl, 19, double tumor, weight 8510 grm., attached left broad ligament by a short, narrow pedicle. Anatomical diagnosis, cystic fibromyoma. Left ovary was the seat of small, follicular cysts, but had no connection with the growth.

CASE III, BILFINGER³.—Autopsy case, fibromyoma right ligament pedicle springing from upper surface and hung from it "like an apple." No connection with uterus and ovaries, which were completely normal.

CASE IV, DORAN⁴.—Removed a ligamentous fibromyoma, weighing over 16 pounds, from a woman of 32 years. Close examination shows the ovary and tube beneath the pedicle, so that the tumor must have originated in the ovarian ligament.

CASE V, GROSS⁵.—Nullipara, 31 years, fibromyoma, having thick pedicle removed from posterior upper portion of right ligament. Ovaries and tubes normal, as well as the uterus. Tumor egg shaped, 2500 gm.

CASE VI, DOLÉRI⁶.—Fibromyoma of broad ligament, having pedicle

5.6 cm. in length. Tumor was globular in form and contained numerous larger and smaller cysts.

CASE VII, *Arch. de Tocol. et de Gynec.*—Case reported of an hysterical person of 23 years. Removal of oval fibromyoma 9 x 6 cm. from upper border of right ligament, with pedicle two fingers breadth from uterus. All genital organs normal.

CASE VIII, L. TAIT¹¹.—Woman, 55 years. Tumor extirpated weighed over 2 pounds; attached by a broad, edematous pedicle to broad ligament, close to, but distinctly separate from the left margin of the uterus. On section, a considerable amount of fluid drained away. The edema spaces were smaller and more numerous, and there was less tendency to the formation of distinct cysts than in the uterine edematous myomata.

CASE IX, DELETREZ¹².—Woman, 42 years, single, for three months noticed enlargement of the abdomen and pain in right thigh. Palpation showed a hard, mobile tumor situated in the median line, below the umbilicus. On laparotomy a fibroid growth, weighing 2500 grms., "size of fist," was removed from right broad ligament, having a pedicle originating near the right side of uterus, which latter was normal; right ovary atrophied, left ovary contained multilocular cyst and was extirpated.

In looking over these nine cases of pediculated fibromyoma, a striking feature presents itself in that most of them were situated in upper portion of the ligamenta lata, *i.e.*, the ala vesperilionis. Sessile interligamentous tumors differentiate themselves clearly from the pedicled variety by having their seat usually in the middle portion of the ligament, which portion is richest in muscle supply and nearest to the uterus. This site of predilection explains the view taken by many authors in the uterine development of this form of tumor. At this site fibromyomata find the best soil for growth, not only by the abundant layers of muscle fiber tissue, but also the uterine artery, with its branches, furnishes copious material for nourishment.

Delétrez says the origin of these tumors has been long contested. Most pathologists consider them as neoplasms emigrating from the uterus to the ligament; others believe they originate in a fragment of ovarian tissue, or from an accessory ovary occurring by an anomaly.

The author has studied as the foundation of this paper twenty-six cases of primary fibromyomata of the broad ligament, sixteen of which have occurred in the past five years and are not included in the series collected by Sängér, Doran, Senn, and Sutton, elsewhere alluded to.

ETIOLOGY.—European literature is much richer in these tumors than American, there appearing eight cases in the French literature alone during the past five years. Several occur in German and a few in English literature during the same period.

Sänger¹³ was the first to demonstrate that these tumors of the broad ligaments form a group to themselves, basing his conclusions on clinical and anatomical grounds, while Virchow¹⁴ was the first to describe clearly and definitely the occurrence of fibromyomata at this site. He himself found a fibroma the size of a bean, of characteristic structure, in the ala vespertilionis immediately above the ovarian ligament, and far away from the uterus and fallopian tube, thus showing definitely the ligamentous origin of the growth.

Numerous authorities are cited by Krekels¹⁵ to show the independent origin of these growths. That fibromyomata are found within the broad ligament, as well as in the uterus, is natural since the same smooth muscle fibres and connection tissue are found here as in the uterus.

ORIGIN.—According to Burkard¹⁶ the most frequent site of origin of fibromyomata of the broad ligament is in that portion nearest the uterus since there exists at this location the greatest abundance of muscle tissue. More rarely they spring from the ala vespertilionis, in which event they are pedicled, whereas the former are sessile. Fibromyomata of the peripheral portion of the broad ligament, *i.e.*, the infundibulo-pelvic ligaments where muscle tissue is very scant, are very rare. Burkard¹⁶ reports such a case in which the tumor, the size of "two fists," was accompanied by a hypernephroma of the same side of 30 years standing, while the fibroma was of 15 years growth. This growth is looked upon as a curiosity and Burkard thinks it possible that the hypernephroma had some genetic influence upon its development.

AGE.—The most frequent occurrence is between the ages of 30 and 50 years. Doran¹⁷ in analyzing 39 collected cases found 6 below 30 years, and the same number above 50 years of age. In the series of 16 cases collected by the writer, the

extremes of age are 22 and 56, of which three occur before 30 and two after 50 years. It is evident from studying this subject that the age of development corresponds in every respect to that of uterine fibroids which was to be expected.

PATHOLOGY.—Fibromyomata occasionally obtain an enormous size, thus Doran¹⁷ reports his case in which the tumor weighed 44½ pounds. In 24 others he gives the weights as follows: Two between 30 and 40 pounds; two between 20 and 30 pounds; ten between 10 and 20 pounds; eight between 1 and 10 pounds; and two below 1 pound. In my own series, collected from the literature of the past five years, the tumors are generally small, as is to be expected since operative treatment is so much more readily and quickly submitted to now than formerly. My own case of 12½ pounds seems to be about the largest of the American cases.

GROWTH.—Growth is generally slow, though it may occasionally be very rapid. As an example of the former, Charodon¹⁸ reports his case as having been observed for twenty years before removal, at which time it was still a comparatively small tumor, measuring 15 x 25 cm. Pollosson¹⁹ also reports his case as having been under observation for 15 years prior to operation, and numerous other authors comment upon the slowness of growth. On the other hand, as an example of rapid growth, Duroux²⁰ reports his case of a large fibromyoma of the ligament which grew so rapidly as to have a clinical history of only 11 months. So rapid was the growth that Duroux was led to make the diagnosis of ovarian cyst.

From studying not only my own series but those of others, collected prior to this, it is evident that in point of growth, as well as in other respects, broad ligament fibromyomata closely resemble those of the uterus in that they, as a rule, grow slowly, especially until after they have obtained considerable size, when at some inexplicable point, sometimes due to adhesions formed, growth becomes rapid. The soft, myomatous form, as in the uterus, grow more rapidly than the denser, more fibrous tumors. The author's case, a typical soft myoma, is a good example of growth in this kind of tumor in which

case growth was very rapid for three or four months prior to removal.

MORPHOLOGY.—The small growths are nearly always mononodular and more or less ovoid in form, while the large ones are frequently lobulated rather than nodular. This lobulation is noted frequently by reporters, notably Doran and Pollosson.

The growths are surprisingly constant in being unilateral, though bilateral tumors do occur as is evidenced by the case reported by Thiery,²¹ in which two fibroids—one on either side of uterus—were removed. It is interesting to note that in this case the uterus was enlarged (twice normal size) though the tumors had no connection to uterus, and the patient suffered from metrorrhagia, which is very unusual. I find only this one case in which the growth was bilateral whereas we would expect the condition commonly.

Histologically, fibromyomata of the broad ligament correspond exactly to uterine fibromyomata, the growth consisting of smooth muscle fibres and connective tissues irregularly distributed. Macroscopically, therefore, the cut surface is firmer, whiter, and more glistening in proportion to the predominance of connective tissue, or redder, softer, and duller when the muscular element exceeds.

These tumors usually have much less fibrous tissue than the corresponding uterine tumors, consequently they are softer, often having a peculiar resiliency not unlike rubber. This is frequently noted by authors, as, for instance, Krekels reports Sanger as having a case in which the tumor was so resilient as to stretch like rubber; and, in the author's case, the resiliency was strikingly noticeable.

Edema of the tumor tissue is by far the most frequent metamorphosis, it having been found present in many cases reported. A very peculiar pathologic condition may arise from a transudation of the fluid within these edematous fibromyomata into the surrounding loose connective tissues, and from there into the natural channels leading to the openings of the vulva, perineum, or inguinal canal and thus produce a condi-

tion simulating hernia. Stern²² describes three such cases as happening in Von Langenbeck's clinic and five such cases were observed by Schröder. In one case a portion of the tumor appeared at the right vaginal wall into the introitus vaginæ.

Nerow²³ published an interesting case in which the patient, aged 44, came to treatment for complete rupture of the perineum and prolapse associated with two small fibromyomata to the right and left of median line, causing bulging of the vaginal wall, which were removed per vaginam, and found located in the connective tissue between the cervix, lateral pelvic wall, and bladder.

DEGENERATIONS.—Cystic degeneration is quite common in fibromyomata of the broad ligaments, the cystic accumulation of fluid being found in large quantities in a few cases, notably so in the cases reported by M. Chardon¹⁸ and Tédénat.²⁴ In the former, there were 12 litres of transparent, yellowish sero fibrinous fluid, and in the latter 8 litres. Usually, however, the fluid is dark in color and small in quantity. Kelly²⁵ reports a case in which the cyst contents was pus.

Demons²⁶ and Wathen²⁷ each report a case of calcareous degeneration, while Harpel's¹ specimen showed mucoid degeneration. Fatty degeneration is also noted by Konrad,²⁸ in a soft myoma of left broad ligament, weighing 20 pounds. Mikulicz²⁹ reported a case in which the tumor, the "size of a man's head," of the right broad ligament, had no connection with uterus or ovaries, although on the ovarian side the tumor contained a small, dermoid cyst.

These tumors seem to be always benign; in no instance have I been able to find a case reported of malignant degeneration.

DIAGNOSIS AND TREATMENT.—The diagnosis of fibromyomata of the broad ligament is more or less difficult even when small, and when large the diagnosis is practically impossible till the abdomen is opened. The symptoms are so uncertain and so variable that little assistance is given from this source. There are a few symptoms, however, which are suf-

ficiently constant to be well worth noting. The unaffected condition of the menstrual function is the most constant symptom, this being remarked upon by almost every author of reported cases in which the uterus was normal. In the author's case the disturbance of menstruation was almost certainly due to approaching menopause. When the uterus is also fibroid, there is metrorrhagia, just as in a fibroid uterus uncomplicated by broad ligament fibroids. Pain occurs only from pressure and crowding of tumor or incidental inflammations of the tumor or neighboring organs which bring about adhesions. Slow growth is the third symptom of importance, and has already been discussed.

Doran says the patients are usually thin and anæmic, although "flooding" does not occur.

The diagnosis where made is nearly always arrived at by the physical examination which, when the tumor is small, may not be difficult.

The treatment is complete removal by operation, the prognosis of which is most excellent, there not being a single death reported from this operation for many years.

Monod⁸⁰ refers to 200 cases collected by Strokeker in 1902 in which the mortality was 22.2 per cent (77 cases, 17 deaths) by simple removal, while it was only 12.2 per cent. (57 cases, 7 deaths) when removal was accompanied by hysterectomy. Most of these deaths occurred prior to 1890.

Doran, in his series of 39 cases, reports 6 deaths in 12 cases of simple enucleation of tumor, all occurring before 1890.

OPERATION.—In the great majority of cases it is necessary to remove the uterus along with the tumor, because hemorrhage is so much more easily controlled and further, if the tumor is removed alone, the uterus is left without support on that side, which is liable to be followed by all kinds of malpositions and adhesions which will prevent the perfect recovery of patient. Castaing and Philippe³¹ report such a case. After the simple removal of a 7-pound fibromyoma from left broad ligament, it was found necessary later to remove uterus and adnexa at a second operation.

The operation itself is, as a rule, easy, the most troublesome feature being the avoidance of the ureters. In most cases this is easy by simple enucleation of tumor by the fingers, after capsule is opened on a line between the point of ligation of the ovarian vessels, at the pelvic wall and the uterine cornu. The ureters are nearly always displaced by the growth and in cases of dense adhesions their avoidance may be very difficult, as is shown by the case reported by Thiery,²¹ in which the fibromata were bilateral and exceedingly difficult to remove on account of ureters which had to be dissected away from tumors on both sides for about 15 cm. Urinary fistula through abdominal wall followed, which closed on fifteenth day after operation. Recovery.

This operation may be made difficult by adhesions to omentum, intestines, or other organs, especially noticeable is Billroth's case reported by Buschmann,³² in which an 18 kg. fibromyoma of left broad ligament was so densely adherent to the left kidney and adnephrium that complete removal of those organs with the tumor was necessary, as every effort to separate them was futile on account of hemorrhage. Adhesions to bladder and abdominal wall are noted as making the operation very difficult in the case reported by Rydyggier;³³ but, as a whole, these tumors are remarkably free from adhesions, which is natural since their site of origin is not connected with any external source of contamination, as are the ovaries and uterus.

Although numerous authors have described the technic of the operation, which is essentially the same by all operators, with modification to suit the individual case, it does not seem profitable to discuss these various modifications of operative procedure, since, in recent years, all methods seem to have been equally successful.

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THE RENAL CATHETER AS AN AID IN THE
DIAGNOSIS OF VALVE-LIKE OBSTRU-
TION OF THE URETER.

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It is not the purpose of this communication to review the many ways the renal catheter may be employed as a means of diagnosis in diseased conditions of the kidney and ureter, but to report two cases of valve-like obstruction of the ureter, and demonstrate how it was used in these two cases.

Dr. H. A. Kelly has not only contributed greatly to the development and perfection of cystoscopy and the catheterization of the ureters in women, but he has also described two especially valuable methods of diagnosis, made possible by the use of the renal catheter. The first of these is the use of the wax tipped catheter as a means of detecting ureteral and renal calculi. This was first published by him¹ in 1895 and in a later communication² he reported twenty-four instances in which the presence of a calculus had been determined from the scratch marks on a wax tipped catheter. By this method calculi have been detected when the X-ray picture has failed to show any shadows suggesting them, and shadows have been present in an X-ray picture, suggesting calculi in the lower end of the ureter, which, after the failure to detect their presence by means of the wax tipped catheter, were shown to have arisen from phleboliths in the veins of the broad ligament. The wax-tipped catheter, as a means of detecting urinary calculi, cannot entirely take the place of the X-ray, for a calculus in a renal calyx or a small one in the pelvis of the kidney may easily fail to come in contact with the wax on the catheter and so escape detection. Other sources of failure in detecting calculi by this method have been fully described by Dr. Kelly.³ The X-ray

picture, when positive, also gives more exact information, such as the size, number and situation of the calculi which cannot be determined by the other method. On the other hand, even at the present time when the technique of radiography is so efficient, the wax tipped catheter gives most valuable information and often enables one to confirm or disprove the results of the X-ray.

The second diagnostic method, devised by Dr. Kelly, is of even greater value and is capable of a wider application than the former. This method is the use of the renal catheter as an aid in determining the seat of obscure pain in the side, by producing artificial renal colic through forced injection of the renal pelvis. The patient is able to state whether or not the symptoms, arising from the distension of the pelvis of the kidney by means of sterile fluid forced through a renal catheter, are similar to or different, both in character and location, from those from which she suffers. This method was presented to the American Gynecological Society in May, 1899. At that time six cases had been investigated by this means and were reported ⁴ in full. Later H. T. Hutchins reported ⁵ one hundred cases, from the records of Dr. Kelly's private sanitarium and the Gynecological Clinic of the Johns Hopkins Hospital, which had been studied in this manner. Hutchins' communication is of especially great value as he has carefully studied and described the character and location of the pain arising from the injection of the pelves of normal kidneys under various degrees and rates of distension.

In the two cases about to be reported I wish to demonstrate a further development of the two methods of diagnosis just mentioned.

CASE I.—Mrs. S. M., aged 57, Johns Hopkins Hospital, Gyn. No. 10860.

Diagnosis.—Stricture of the intra-mural portion of the left ureter with a secondary valve-like obstruction at the pelvic brim.

Treatment.—Resection and re-implantation of the ureter into the bladder, release of the "kink" at the pelvic brim, both by the extra-peritoneal inguinal route, through a "gridiron" incision.

History of Case.—The patient complained of severe attacks of pain in the left side and back. She was transferred from the Medical to the Gynecological Clinic of the Johns Hopkins Hospital on November 9, 1903. (At that time I was resident gynecologist at that Hospital.) Past history was of little value; married, six children, oldest thirty-six and youngest twenty-six years of age. There was no record of any illness until the present one.

Present illness began in May 1902 with attacks of severe pain in the region of the left kidney. At first the pain did not radiate and there were not any urinary symptoms. These attacks had been increasing in severity and in frequency, and in the later ones the pain had radiated from the region of the left kidney down towards the bladder. She was unable to void during or just after one of these attacks. There had never been any blood in the urine nor had she passed any calculi, although her attacks had been diagnosed as renal colic. The patient was studied in the ward and had two of these attacks in five days. These seemed to be very severe and were controlled by large doses of morphia. The examination of the urine showed it to be normal.

The patient's general condition was apparently excellent. She was very large and the physical examination was unsatisfactory. While no mass was felt in the region of the left kidney (abdominal walls were very thick) there was tenderness in this region and along the course of the left ureter.

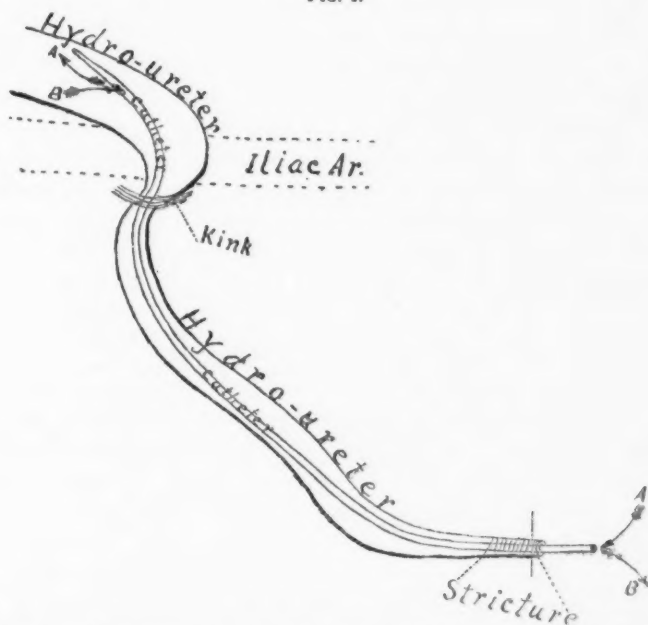
November 16, 1903, I made a cystoscopic examination; patient in the knee-chest posture. The bladder, including both ureteral orifices, appeared to be normal. Repeated attempts to catheterize the left ureteral orifice failed. There seemed to be a stricture of the intra-mural portion of the ureter. A few hours after this examination, the patient suffered from the most severe attack of pain she had ever had and it was necessary to anesthetize her with chloroform in order to relieve her. The attack did not cause any elevation in temperature or increase in pulse rate.

Observations which should have led to the diagnosis of ureteral stricture and secondary "kink," with valve-like obstruction, November 18, 1903.

As a result of the previous examination it seemed evident that there must be a stricture of the intra-mural portion of the

ureter and the question arose as to its cause. A small ureteral catheter with a filiform point was chosen. The wax, used for "tipping" the catheter for the diagnosis of urinary calculi, was melted and by means of sterile forceps four drops of the melted wax were applied to the catheter at intervals. The entire catheter was warmed by passing it through the flame of an alcohol lamp

FIG. 1.



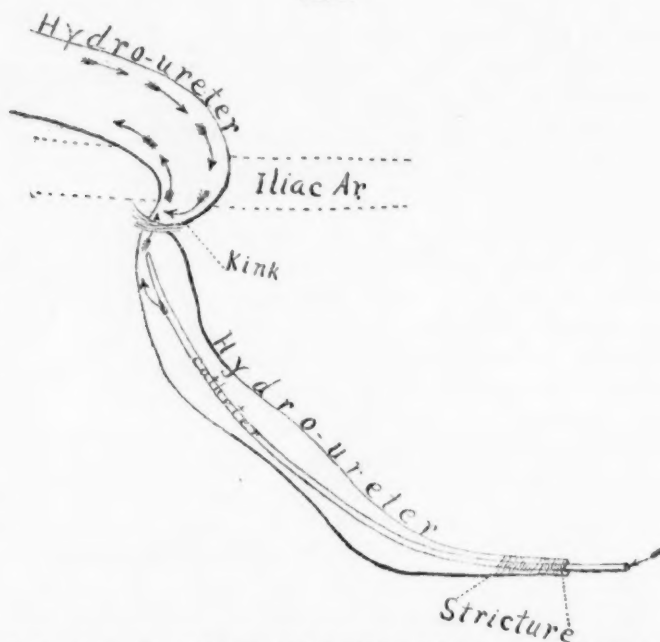
Stricture of the intra-mural portion of the ureter with hydro-ureter and valve-like obstruction of the ureter at the pelvic brim, $\times \frac{3}{8}$.

This illustration represents the condition found in the first case. The stricture (cause not determined) of the intra-mural portion of the ureter, gave rise to a tortuous hydro-ureter above. This tortuosity was so great as, in places, to cause a form of hernia of the ureter through the tissues surrounding it (its sheath) with a consequent "kinking" of the ureter where its displacement was most restricted. A small renal catheter was introduced with difficulty, the distance indicated. Artificial renal colic was induced by injecting fluid through the catheter and the patient was again relieved by permitting the fluid to return through the catheter as indicated by the arrows A and B.

and at the same time the drops of wax attached to it were melted, and then by tipping the catheter up and down the melted wax flowed over the entire catheter and coated it with a fine coat of wax which increased but very little its diameter. This represents but a further development of the wax-tipped catheter of Dr.

Kelly and one which I have used for the detection and localization of calculi in the ureter. The catheter easily passes the calculus and the wax coating is scratched for the distance it extends beyond the calculus. By taking measurements one is able to estimate the situation of the calculus. A calculus so detected and located by the author has been reported.⁶

FIG. 2.



Further observations in Case I, which should have led to the correct diagnosis, x %.

On slowly withdrawing the catheter (shown in Fig. 1) the return flow suddenly ceased when the eye of the catheter had apparently been drawn past the "kink," see Fig. 2. Artificial colic was induced with the catheter in its present position, but only a small amount of the fluid was returned (that from the pelvic portion of the ureter). The large amount which had extended beyond was prevented from returning by the "kink," which acted as a valve and the greater the distension above, the more efficient the valve. The condition was relieved by pushing the catheter further up the ureter when the fluid gushed from the end of the catheter, thus indicating that the eye of the catheter was then situated above the "kink."

Through a Kelly cystoscope, the patient in the knee-chest posture, the wax coated catheter was inserted into the left ureteral orifice and with considerable difficulty it was passed up the ureter for a distance of about 10 cm. when it apparently encountered another obstacle. After a little more manipulation this was passed and urine escaped freely from the catheter. This

caused me to think that there were two strictures present, instead of one. The patient now assumed the Sim's posture (more comfortable) and artificial hydronephrosis was induced by injecting sterile fluid through the catheter as described by Dr. Kelly. This procedure caused an attack of pain which was similar in every way to those from which the patient suffered. On permitting the fluid to escape from the catheter, the patient was instantly relieved (see Fig. 1). The catheter was then partially withdrawn (Fig. 2), and on again injecting fluid into the ureter an attack similar to the first one was produced but on permitting the fluid to escape only a very small amount came away (probably only that in the pelvic portion of the ureter) and the patient was not relieved. After waiting, in vain, a few minutes for the escape of the fluid the catheter was withdrawn. As the patient was still in pain the ureter was catheterized again and after passing the same distance into the ureter as before, fluid gushed from the end of the catheter affording great relief to the patient.

It was evident, from this examination that there was a stricture of the intra-mural portion of the ureter and an obstruction at or near the pelvic brim which permitted fluid to pass it from below upwards but prevented its return. The absence of scratch marks on the wax coated catheter excluded the possibility of either obstruction being due to a calculus.

Operation with description of condition found, November 21, 1903.

Under ether anaesthesia, an incision was made through the skin parallel to the left Pouparts' ligament, and the fascia and muscle of the abdominal wall were separated forming a so-called gridiron incision (as in the well-known McBurney incision) down to the peritoneum. The latter was now pushed back from the abdominal wall and the side of the pelvis. The uterine artery was ligated and cut and the left ureter was exposed from above the pelvic brim to its entrance into the bladder. It was dilated and especially the portion above the pelvic brim, where its diameter was nearly 1.5 cm. The ureter was very tortuous and just beneath the pelvic brim a distinct kink was present which was caused by connective tissue crossing the ureter and above this kink occurred the greatest distension of the ureter. The condition present seemed to have arisen as follows: The ureter

through its peristalsis tends to form a sheath from the tissue about it. This sheath varies with the tissue along its course and cannot be considered as a distinct structure belonging to the ureter. It is more marked in some individuals than in others and is usually better formed about the pelvic than the abdominal portion of the ureter. For these reasons the sheath can sometimes be definitely demonstrated in cross section and in other instances not. This sheath is of very little importance but occasionally plays an important rôle in pathological conditions, as has been previously emphasized⁷ by the writer. In this patient a stricture (cause not determined) was present in the intra-mural portion of the ureter. The obstruction to the outflow of urine gave rise to distension and an increased tortuosity of that duct. A kink apparently arose from a tortuous part of the ureter breaking through a weak portion of its sheath, *i.e.*, a hernia, and the lower portion of the hernial ring was formed by the stronger structures of the sheath which did not give way but held the ureter in place at that spot. The kink occurred at the lower end of the abdominal spindle, *i.e.*, at the situation of a natural constriction of the ureter.

The fibres causing the kink were severed, the ureter freed and immediately the kink disappeared. A small incision was made in the upper part of the pelvic portion of the ureter and a medium sized renal catheter was passed towards the bladder but could not be made to enter that organ. The ureter was cut off just above the bladder, and after excising enough of it so as to reduce its tortuosity, it was re-implanted into the bladder in the following manner. A pair of long artery clamps was introduced through the urethra, pushed against the bladder wall just above the original insertion of the ureter and the bladder was incised at this place. The forceps were then pushed through and made to grasp the end of the ureter which had been split for a distance of .5 cm. This was then drawn into the bladder for a distance of about 2 cm. and held in place while the bladder wall was sutured to that of the ureter with fine silk, taking care not to compress the latter. A renal catheter was now passed into the bladder through the opening made in the ureter and drawn through the urethra. The opening in the ureter was closed with one silk suture and the field of operation drained with iodoform gauze.

Post-Operative Course.—A urinary sinus developed through the inguinal incision, apparently from the opening in the ureter. The patient left the hospital on December 23rd with a slight urinary discharge which was not constant. This discharge ceased entirely in the early part of January, 1904, and the patient felt completely relieved. At about that time (date not present in the records) a cystoscopic examination was made and the end of the ureter could be seen projecting from the bladder wall for a distance of about 1.5 cm. Attempts to catheterize this failed and fearing that so long a portion of the ureter projecting into the bladder might act as a foreign body and cause trouble, about half of it was amputated by means of a nasal wire snare introduced through a Kelly cystoscope. On January 28, 1904, another cystoscopic examination was made. The ureter now projected about .5 cm. into the bladder, it could be seen to retract and urine spurted from it as from a normal urethral orifice and a medium sized renal catheter was inserted without difficulty.

In a letter received from the patient in April, 1907, over three years after the operation, she stated that her general health was excellent, she had not had any attacks of "renal colic" but that she occasionally had some pain low down in the left inguinal region and especially after taking long walks.

CASE II.—Miss F. S., aged 20, Gyn. No. 11001.

Diagnosis.—Probable valve-like obstruction of the upper end of the ureter, diagnosed by means of the renal catheter.

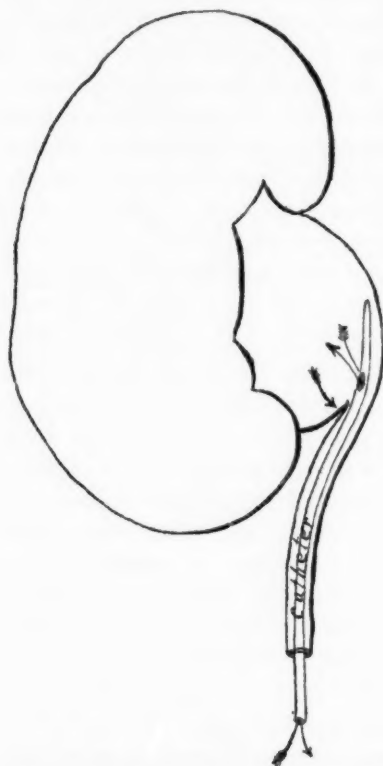
Treatment.—Dilatation of the upper end of the ureter by means of graduated bougies (olive and spindle-shaped enlargements of wax on renal catheters).

History of the Case.—The patient has already been referred to in a publication² by Dr. Kelly showing the value of the wax-tipped catheter as a means of detecting renal and ureteral calculi, under cases Nos. 19, 22, 27, and 33 of that article. She had been operated upon by him four times, three nephrolithotomies, twice on the right kidney and once on the left, and at the last operation in October, 1903, an exploratory nephrotomy of the right kidney was made and also the upper end of the ureter was freed. Nothing was found in the last operation to account for the pain in the right side; both X-ray and wax-tipped catheter were negative for the right kidney but the X-ray showed a calculus in the left kidney from which the patient did not have any symptoms.

The patient was re-admitted in January, 1904, and stated that she had had six severe attacks of pain in the right side since she left the hospital the previous November.

The following report is from records of observations I made of the case during her last admission and demonstrate some of

FIG. 3.



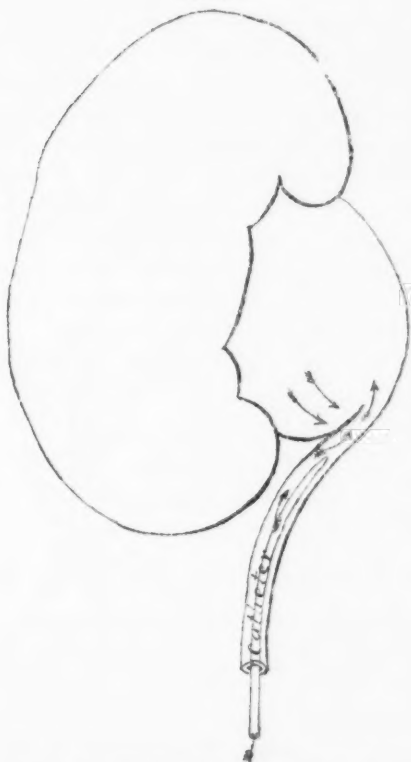
Probable valve-like obstruction at the origin of the ureter from the renal pelvis, x $\frac{3}{4}$.

This illustration represents the condition possibly present in the second case. As in the case represented in Fig. 1, artificial renal colic could be induced and again relieved by permitting the fluid to return through the catheter, which extended into the pelvis of the kidney.

the possibilities in the use of the renal catheter. These observations were not confirmed by operation. It must be remembered that calculi had been removed from the right kidney twice and at the last operation an exploratory nephrotomy had failed to reveal any and the X-ray and wax-tipped catheter were negative.

On January 27, 1904, patient in the Sim's posture⁷ (in this case this posture was as serviceable as the knee-chest and was easier for the patient) a cystoscopic examination was made and the right ureter was easily catheterized with a large renal catheter. The catheter was passed up into the renal pelvis and artificial renal colic was

FIG. 4.



Further observations in Case II, which led to the probable diagnosis, π %.

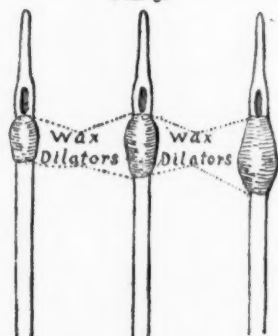
On slowly withdrawing the catheter (shown in Fig. 3) the return flow suddenly ceased when the eye of the catheter had apparently been drawn past the "valve," see Fig. 4. Artificial colic was induced with the catheter in its present position, but only a small amount of fluid was returned. The condition was relieved by passing the catheter up into the pelvis of the kidney.

caused by injecting sterile fluid through the catheter. This caused pain similar to that from which she suffered and she was relieved by permitting the fluid to escape from the catheter (see Fig. 3). Bearing in mind the first case, the pelvis was again

distended with fluid and then the catheter was slowly withdrawn a short distance when suddenly the fluid ceased to flow and the patient was not relieved. After waiting a few minutes for the fluid to appear, I attempted to re-introduce the catheter into the pelvis of the kidney, failed at first but finally succeeded. It seemed that there must be present a valve-like stricture or kink near or at the renal pelvis which prevented the outflow of urine when the pelvis was distended (see Fig. 4).

The patient refused to be operated upon. On the other hand, she consented to attempts to dilate the upper end of the ureter. Dilators were devised by making spindle enlargements of wax on the ends of large renal catheters just below the

FIG. 5.



Wax dilators on the end of renal catheters, used in dilating the ureteral "valve" in the second case, natural size.

These were made by applying melted wax to each catheter, just below its eye, and then moulding the wax by turning the catheter in the flame of an alcohol lamp. As "olive-tipped bougies" they may be felt to "hitch" over any narrowing of the ureteral lumen, and by passing them to and fro into the renal pelvis, of the second patient especially, when the pelvis was dilated, thus narrowing the valve-like obstruction or "kink," the efficiency of this "valve" was apparently destroyed. Artificial renal colic could be induced and the patient relieved, even though the end of the catheter was not in the pelvis of the kidney. The patient has not had any attack of pain in the region of the kidney since their use (over three years ago).

eye so as not to obstruct the lumen of the catheter (see Fig. 5). These dilators were easily passed up the ureter in this case, even dilators having a diameter of 3-4 mm. The pelvis of the kidney was distended by injecting fluid through the catheter so as to force the valve back against the catheter and then the latter was repeatedly partially withdrawn and pushed back with the hope that the spindle enlargement, which could be felt to "hitch" over the obstruction, would destroy the efficiency of this ob-

struction (valve). This was tried on four different occasions, at intervals of two or three days. After this treatment I felt encouraged for the valve was apparently no longer efficient as fluid would escape, in time, from the catheter after the latter was partially withdrawn, showing that the fluid could escape (though slowly) from the distended pelvis of the kidney even when the catheter was not in it.

The treatment on February 17th was more vigorous than usual as I hoped it to be the last one. After the patient returned to the ward she had a severe attack of pain in the right side similar in every way to the previous ones. As this pain did not subside I catheterized the kidney and as the catheter entered the pelvis, blood with clots flowed from the catheter. Two hundred cc. of blood was collected and the patient was immediately relieved. This apparently demonstrated that the valve was probably still efficient for blood had not appeared in the bladder, it having been all retained in the pelvis of the kidney. Apparently the attempts to destroy the efficiency of the valve had failed. The patient remained in the hospital a month longer and while the wax bougies were again tried greater care was exercised in their use in order to prevent any further injury.

In a letter received from the patient, in May, 1907 (over three years after the treatment with the wax dilators), she stated that her general health was excellent and that she had not had any pain since she left the hospital in March, 1904. The efficiency of the valve-like obstruction, at the orifice of the ureter from the renal pelvis, had disappeared and apparently as the result of passing wax dilators to and fro into the pelvis of the kidney, at a time when the valve was most efficient, viz., when the pelvis of the kidney was distended with fluid.

Hutchins, in the article previously mentioned, reports an instance of distension of the pelvis of the kidney without return of the fluid, demonstrating a valve-like occlusion of the pelvis. This observation was made by him in March, 1906.

RESUMÉ.

Ureteral "kinks" may arise from various sources, as an abnormal origin of the ureter from the pelvis of the kidney, blood vessels crossing the ureter, adhesions, etc.

I wish especially to call attention to the part played by the tissue *normally* present about the ureter, in causing these "kinks." As I have previously stated the peristalsis of the ureter tends to convert this tissue into a form of sheath which, as such, may be distinct in one place and less distinct or absent in another. Any interference with the outflow of urine from the lower end of the ureter causes a dilatation of the ureter and its course becomes more tortuous. This tortuosity is but an exaggeration of its natural course brought about by the dilatation of the ureter and the varying amount of interference with its peristalsis from the tissue along its course. This tissue (its sheath) being stronger in some places than in others restricts both the distension and the movements of the ureter at these places while the less resistant tissue, above or below these, permits it to become distended and to curve to either one side or the other. This lateral displacement of the ureter is sometimes so marked as to form a sort of hernia of the ureter through the less resistant tissue (a weak place in its sheath) about it. The tissue which restricts the movements of the ureter in these cases may so kink the ureter as to give rise to a valve-like obstruction which occludes the lumen of the ureter only when the portion above the kink becomes greatly distended. This distension of the ureter may be caused by anything interfering with its outflow.

It is important, therefore, when operating for ureteral obstruction to carefully examine the ureter above, in order to relieve any kinks which may have developed as a result of the obstruction and which otherwise might not be entirely relieved by the operation. There is a natural constriction of the ureter at the pelvic brim due to the tissues about it, and also to its change in direction, as it dips into the pelvis. There is at this place, therefore, a condition present which predisposes to the location of a kink, as occurred in the first case reported.

Valve-like ureteral kinks from any source or of any location may be detected by the renal catheter in the following manner. If the end of the catheter is passed beyond the kink, and sterile fluid is injected through the catheter, distending

the ureter and renal pelvis above, the patient will complain of pain (artificial renal colic) and on removing the rubber bulb or syringe from the end of the catheter, but leaving the catheter in place, the fluid injected into the pelvis of the kidney will escape from the catheter and usually with relief from the pain or discomfort. On the other hand if, after distending the pelvis of the kidney with the fluid, the catheter is slowly withdrawn, the fluid will escape until the eye of the catheter has passed the kink and then the flow will cease and the patient will not be relieved. If more fluid is now injected through the catheter the symptoms are intensified and still it will not return unless the catheter can be pushed further up into the ureter so that the eye is situated above the kink when the distended renal pelvis or renal pelvis and ureter above the kink (as the case may be) will be able to expel the fluid through the catheter.

A spindle or "olive" enlargement of wax may be made just above or below the eye of the catheter and as an "olive-tipped" bougie it may be felt to "hitch" over the kink and so aid in its diagnosis and localization. These bougies may also be used as dilators.

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THE CONSERVATIVE SURGICAL TREATMENT OF THE HYPERTROPHY OF THE PROSTATE GLAND IN THE VERY FEEBLE AND AGED.*

BY JOHN E. SUMMERS, JR., M.D.,

OF OMAHA, NEBRASKA.

It has seemed to me that too many experienced surgeons were minimizing the dangers of prostatectomy and in this way creating a tendency among the relatively inexperienced, to underestimate the seriousness of the procedure. More especially is this so when the sufferers are very feeble and aged, and nearly worn out by pain, unrest and hemorrhage.

A little late for many, but fortunate for those who could profit, Dr. Charles H. Chetwood, of New York, published a paper in the *ANNALS OF SURGERY*, October, 1906, directing particular attention to "Prostatectomy in two Stages," a most excellent and instructive contribution. He refers to a special class, viz., the feeble and aged suffering from prostatism and its several complications.

There is nothing new in Dr. Chetwood's paper; others years ago, in practice, have recognized the value of this procedure in the surgery of the prostate, yet no one so far as I am informed has so directly and so well forced our attention to this "Conservative Operation with Minimum Hazard."

Early in my experience in the surgery of the prostate, I was impressed with the value of conservatism. Some seventeen years ago, a valued citizen of Omaha, much weakened and depressed by the pain and hemorrhage from an enlarged prostate, was subjected to a supra-pubic prostatectomy (the McGill operation). I acted as first assistant, and the operator, coming from a long distance, was one of America's most distinguished genito-urinary surgeons, and at the time the most

* Read before the Iowa State Medical Society, Cedar Rapids, Iowa, May 15, 1907.

experienced American operator in the surgery of the prostate. My judgment expressed then was to "drain first"; but of course as my experience in the surgery of the prostate was so very limited, it was given scant attention—in fact, I did not then know how valuable the suggestion was. The patient died at the end of a week from a septic pneumonia. From time to time, I did this supra-pubic operation with varying success. As time went on, the technique of the supra-pubic operation improved; as it did so the mortality diminished, until to-day it is a very safe procedure.

The Bottini and Chetwood galvanic-cautery operations certainly have their place when patients are in a weakened state.

"Each case has its own personal equation, comprehending the important features bearing upon it. Amongst these features of accepted importance we may cite the age and general vitality of the patient. It stands to reason that other things being equal, statistics confined to patients seventy or eighty years old should show a relatively high degree of mortality. Again, the kidneys bear so important a relation to the immediate condition and future outlook of every prostatic about to be operated upon, that the greater the damage already to these organs the less can they be expected to withstand any additional strain consequent upon operation.

"If we sum up briefly the dangers and difficulties to be contended with in prostatic operations, as urinary suppression, secondary shock, and general toxemia, and in especially congested prostates—profuse hæmorrhage, the mortality rate or hazard should bear a more or less direct relation to the existence of these features in any given case" (Chetwood).

Commencing about four years ago, after I had learned to do a perineal prostatectomy properly, I began occasionally in bad cases, to separate the operative procedure into first, a preliminary supra-pubic cystotomy: and later, one week or maybe one month, to remove the prostate through a perineal wound. My reasons for following this sequence may be summarized in this way:

Preliminary supra-pubic cystotomy is preferable to preliminary perineal cystotomy.

First.—It allows of a more thorough examination of the bladder for stone or other complications. As an illustration: An elderly gentleman, a sufferer from prostatism, had his prostate and bladder explored by means of a perineal urethrotomy. The operators were competent; as evidence, one was an ex-president, the other later, president of the American Genito-Urinary Association. These gentlemen decided that prostatectomy was inadvisable because of the inflamed condition of the prostate. The man came to Omaha. Shortly after the perineal wound closed, an enormous stone, evidently of years' formation was removed from his bladder by supra-pubic cystotomy. This stone could not have been overlooked had the original exploration been by the supra-pubic route.

Second.—It allows of a more peaceful drainage: there being less irritability than from the presence of a perineal drainage tube.

Third.—A properly performed supra-pubic cystotomy, if partly closed after the method of Gibson, making a valvular fistula, admits of drainage and irrigation without discomfort, allows of change of position in bed, even getting up early; thus lessening the dangers of hypostatic pneumonia, and bettering the appetite and digestion.

If the patient for any good reason, either upon his part or upon your own, decides not to go farther, you have done the best that the circumstances admitted of.

Perineal drainage under such circumstances will be impracticable.

The prostatectomy may be either supra-pubic or perineal: It is a matter of choice in the experience of the individual operator. My preference is for the perineal route, but I must confess I am beginning to waver, but only a little. As to the choice of methods of the perineal prostatectomy in all patients who have been previously drained supra-pubically, I have strong opinions. First, if the prostatectomy is done soon after the supra-pubic cystotomy, any method may be pursued, but if

there is an old supra-pubic wound or scar, of a month or of years existence, then I believe the intra-urethral attack upon the prostate is the better as offering less danger of recto-vesical fistula either resulting immediately, or later from sloughing. The reason is obvious, because the bladder firmly attached to the anterior abdominal wall does not admit of the prostate being drawn as near the surface of the perineum as when no such relation exists. Therefore the separation of the prostate from the rectum and its enucleation is more difficult. In the intra-urethral attack, Bryson's Operation, no such danger usually exists, at least it should not except possibly in malignant disease.

I wish to refer briefly to several from among my cases, which I have chosen in illustration of what has been said.

CASE I.—Mr. J. M. S., 66, widower, Papillion, Neb.; admitted to hospital May 30, 1905. Urine draining through a supra-pubic opening made by me two years previously, as a preliminary to a supra-pubic prostatectomy—the latter temporarily refused. Pain, loss of sleep, and hemorrhage had finally determined the man to seek relief through a further operation. Temperature, 99.8° F.; pulse, 80. Urinary examination demonstrated a chronic interstitial nephritis. Urotropin and sandal wood oil were given; copious draughts of water were insisted upon. The patient was kept under this preparatory treatment for five days, during which time the temperature and pulse varied from normal to 101.8° F. and 96, respectively.

A perineal section (Murphy type) was made June 5th, and the prostate removed. The temperature and pulse were normal the second and third days following the operation. From the fourth to the eighth days the temperature and pulse rose and fell irregularly, varying from 98.4° F. to 102° F., and from 76 to 102. From the eighth day on, the temperature and pulse remained normal. The patient was discharged July 18th, perineal wound draining feebly; supra-pubic wound closed. Continence with closing of perineal wound soon followed. The patient died one year later from endocarditis, having had very little bladder trouble after leaving the hospital.

CASE II.—Mr. B. S., 76, married, Chadron, Neb. Admitted

to the hospital July 9, 1905, after making a railway journey of four hundred miles. He was very weak and suffered from pain, loss of sleep and hemorrhage. The preliminary treatment was similar to that of Case I, with the addition of strychnin hypodermically, and was continued for four days, the temperature and pulse varying from 98.4° F. to 99.6° F., and from 70 to 86. July 13th, the patient having recovered from the effects of the journey, the prostate was removed through a perineal incision (Proust's operation). For eight days following the operation the temperature varied from 99.8° F. to 102° F., being usually 100.5° F. to 101° F., while the pulse during that time was proportionately lower, never being above 100, usually 86. The temperature became lower, ranging from 98.4° F. to 100.4° F., while the pulse went up steadily. The patient died July 27th.

I have thought that had I done a preliminary supra-pubic cystotomy, the final end might have been long postponed.

CASE III.—A. C. B., 78, widower, Omaha. For past twenty years or more the patient had used a catheter, gradually using it more often. May 29, 1906, the patient found that he could not succeed with the catheter and called a near-by physician who found it necessary to use a metal catheter many times during the two days following. June 1st, after much difficulty, the physician discontinued trying to pass the catheter, as he encountered considerable bleeding and the patient had grown weak; the patient was sent to the hospital. A supra-pubic cystotomy was done at eight P.M., June 1st. The bladder drained well for three weeks, the pulse and temperature going up and down irregularly the first two weeks, but gradually becoming regular. There was great difficulty in getting the bowels to move because of the large irritable prostate.

June 3rd, perineal section was made, and the prostate removed (Bryson's operation). The temperature and pulse varied irregularly from 98.8° F. to 102.4° F. and from 86 to 116. The patient developed a periurethral abscess. This was opened July 15th, and drained, from which time recovery gradually followed.

At present he gets up two or three times a night to void—can retain urine five hours—and voids about the same number of times during the day.

Patient's general condition is very good at this date.

CASE IV.—A stout, but fairly rugged Italian, age 83, resident

of Omaha, had used the catheter for many years, but recently had had several attacks of retention. He was brought to the hospital June 15, 1906, by his physician, Dr. Womersley, who finally in the last attack was unable to relieve him. I did a supra-pubic cystotomy (Gibson). An enormous hydrocele on the right side was the source of great annoyance. On the eighth day after the cystotomy, I did a radical operation for the cure of the hydrocele and also removed the prostate by perineal section (Bryson's operation). The patient could not be controlled; he was up and out of bed the first day after the operation, and nearly every day thereafter. He remained in the hospital six weeks. A recent report from the old man says that he is in splendid condition. It was impossible to give him quieting medicine of any kind, he would not allow a hypodermic injection; he would not take pills or capsules; and would only take liquids after insisting that the nurse swallow some first.

All of these cases had large prostates, and represented the type of "bad risks" which, in my judgment, demand conservative surgical treatment. In common with others, I have had numerous brilliant successes following immediate complete operations in this and other fields, but too often a failure has occurred which might have been averted by a two-stage operation.

EPITHELIOMA OF THE PENIS. AN ANALYSIS OF ONE HUNDRED CASES.

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THIS paper is based on a study of 100 unselected cases of epithelioma of the penis. Of this number 93 were taken from the records of the Massachusetts General Hospital during the 33 years from January, 1872, to January, 1905;¹ the remaining 7 were gathered from private sources.²

This investigation was undertaken:

1. To see what end results have been obtained after operation.
2. To present what clinical facts have been observed in a study of so large a number of cases.

Accordingly the hospital and private records have been thoroughly analyzed, and each case has been followed as far as existing clues would permit. This has involved the searching of state and town records, personal interviews, and a profuse correspondence with the patients, their relatives, and local authorities. As a result 90 per cent. of the cases have been traced to a definite end. When it is stated that just 50 per cent. of this series were operated on previous to 15 years ago, and that nearly 25 per cent. were seen prior to 25 years ago, the results of this search are not discouraging. This paper is unique, in that never before, so far as I know, have as many as 100 cases been so critically examined, and followed to their end results.

¹ My hearty thanks are due to the surgeons of the Hospital Staff, past and present, for permission to use these cases.

² I am deeply grateful to Drs. F. G. Balch, H. H. A. Beach, W. A. Brooks, F. B. Harrington, Horace E. Marion, J. C. Munro, and M. H. Richardson for the use of cases from their private records.

ETIOLOGY.

(a) Contributing causes.

Frequency.—As already noted 93 of these cases embrace 33 years of the existence of the Massachusetts General Hospital, giving an average of only about 2.8 cases yearly. Taken in decades these cases are found to have been seen at the hospital with increasing frequency as the following figures show: 1872-1882, 21 cases; 2.1 cases yearly. 1882-1892, 29 cases; 2.9 cases yearly. 1892-1902, 30 cases; 3.0 cases yearly. 1902-1905, 13 cases; 4.25 cases yearly. Total, 93 cases.

A search for additional cases to complete my series of 100, disclosed the fact that many surgeons of large experience had had no case of cancer of the penis in their practice.

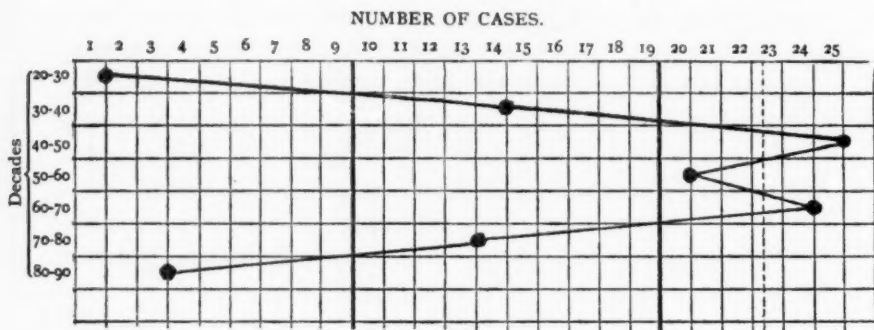
Andrews, in 7881 cases of primary cancer in all regions, saw only 62 of cancer of the penis, or 1.27. Paget states that it forms but 1 per cent. of all cancers, Von Winiwarter 2.5 per cent., while Billroth puts it at 3 per cent. Sawtelle in the United States Marine Reports for the 5 years ending June, 1891, saw but 7 cases out of 70,826 cases treated. Cancerous disease of the penis is therefore rare.

Age.—In this series the two extremes of age during which cancer may occur were illustrated by a man of 25 years on the one hand, and a man of 82 years on the other. A search of the literature reveals a case of carcinoma of the penis occurring in a child of two years reported by Creite (I quote this statement simply on its own merits. Undoubtedly the interpretation of the term "carcinoma" used by Creite differs widely from that used by the majority of pathologists). Curtis mentions a case of Weir's occurring at 18 years of age. Kaufmann, from an analysis of 227 cases, states that it is most common in the 6th decade, and after that in the 5th and 7th. In 3 out of 130 cases he found the age to be between 21 and 30 years. Demarquay, in 134 cases, saw 9 between 20 and 30 years of age. He quotes Ricord on the other hand, as saying that he never saw a case under 40 years of age.

Taken by decades these cases are as follows: 20-30 years,

1 case; 30-40 years, 14 cases; 40-50 years, 25 cases; 50-60 years, 20 cases; 60-70 years, 24 cases; 70-80 years, 13 cases; 80-90 years, 3 cases. Total cases, 100.

Graphically presented this gives a rather interesting curve:



The average age was 56.02 years.

Civil State.—Of these 100 cases, 85 were, or had been married, while only 11 were single. The state of the remaining 4 was not recorded. In a measure this fact is of little importance, as most men by the time they reach middle life have married. But as almost every treatise on cancer of the penis states that the disease may be the result of contact with a cancerous cervix, I give these figures so that inferences may be drawn.

Contact with Cancerous Cervix.—In this series there was not even a suggestion of this being an etiological factor. Demarquay cites one case which seems to have been acquired in this way. He also quotes examples of cancer of the cervix where coitus had taken place over a long period of time with no implantation on the penis. Martin quotes McFarland, who searched the literature most thoroughly, and found eight cases which, as far as anyone could tell, were undoubtedly due to contact with a cancerous cervix. Bruce cites the case of a man of 58, whose wife died of cancer of the uterus of many years' duration. The man developed a cancer on his penis during the year following her death.

Occupation.—The question of occupation is of no great

importance. Almost every trade or profession has its representative as follows: Laborers 16, carpenters 10, shoemakers 7, farmers 7, machinists 5, merchants 4, sailors 3, butchers 3, clerks 3, printers 2, grocers 2. Total, 62.

The remaining 38 cases all followed as many different callings. The large number of laborers is of little significance as hospital patients are drawn largely from the laboring classes, and the fact that the disease occurs in so many different sorts of workers is sufficient to throw out occupation as a contributing factor. The fact that it occurs mostly in those who do hard manual work might lead one to suppose that trauma played its part. In the records of these 100 cases, only 13 had been questioned particularly on this point. Of these 13, only 3 recalled having any injury to the penis.

Nationality.—The nationalities of these cases are as follows: Americans 53, Irish 25, English 16, Germans 3, Italians 1, unknown 2. Total, 100.

It is worthy of note that the Jewish race does not figure in this list of nations. This is all the more notable when we consider that these people contribute generously to the files of almost every other disease. But is it only a coincidence that a race whose men have been circumcised from time immemorial does not appear in this series?

Other writers (Travers, Patterson) have also noted the immunity of the Jew from this disease. It is also curious that this series includes no negro. I have found no mention of the fact that the negro is exempt from cancer of the penis, and I have no explanation to offer for it. In a search of the literature I find but one case occurring in a negro. I do not mean to say that this disease is rare in the negro. His absence from this series is perhaps explained by the fact that in these parts negroes form a small percentage of all cases.

Heredity.—This, as in cancer elsewhere, seems to play little or no part in the etiology, as in this series only 1 case had a family history of cancer, but that curiously enough was of the penis in the man's father.

(b) Immediate causes.

The term "immediate" causes is somewhat ambitious perhaps, for cancer of the penis, like all other cancer, arises still without known cause. Under this heading however I have grouped those clinical facts which seem to me to have the most important bearing on the origin of the lesion. They are arranged in order of importance.

Phimosis.—This condition is conceded by practically all writers to be the most important factor in cancer of the penis. In this series note was made of the presence or absence of this condition in but 42 cases. Of these it was absent in 6, present in 36, or over 85 per cent. In most of the 36 the patient said he "was never able to retract his foreskin," a fact which would indicate a congenital phimosis, or one of many years duration. My findings are in accord with those of Demarquay, who noted phimosis in 42 out of 59 cases. When we consider that a phimotic condition causes a retention of smegma, or of a few drops of urine, both of which rapidly decompose, and that as a result of this ever-renewed condition the glans and foreskin are constantly bathed in a foul, acrid discharge, it is not surprising that the soil is fertile for malignant as well as for benign growths. In fact Kaufmann goes so far as to say that in elderly men with phimosis, and a foul discharge under the prepuce, the possibility of cancer should always be born in mind, even without the presence of induration. Furthermore this chronic balanitis is frequently associated with the so-called "venereal wart," and according to Kaufmann 29 out of 33 cases of cancer of the penis collected by him began with what were apparently these simple vegetations. The observations of other writers are similar to this.

Here again I must lay special stress on the fact that a large number of these cases had phimosis with its concomitants, and that not a single circumcised Jew was found in the 100 cases. This seems to my mind a most convincing argument in favor of circumcision, in all those cases where the prepuce cannot be easily and completely retracted.

Venereal Disease.—The number of cases in this series in whom the history of previous venereal disease was sought for

was 49. Of these, 22 acknowledged it, while 27 denied it. Unfortunately the records stated in only a few instances whether the venereal disease was in the form of gonorrhœa, chancroids, or syphilis. Two cases however gave a definite history of a specific lesion on the penis, and stated with certainty that the cancerous process had begun on the site of the chancre.

CASE I.—Age 69 years, married, hotelkeeper. Entered Dr. C. B. Porter's service in November, 1894. Contracted syphilis 35 years before entrance. Two and a half years previous to entrance he noticed a little ulcer on the prepuce in front of the corona, on the site of the chancre. Says he has had three or four similar ulcerations on the same place lasting a few days during the past 25 years. This last ulcer continued steadily in spite of treatment. Examination showed a large, hard, ulcerating mass in the prepuce and on the glans. The growth has ulcerated so that there is a large cavity mostly in the dorsum and left side of the penis. Glands in both groins enlarged.

CASE II.—Age 46 years, married, moulder. Entered the service of the late Dr. John Homans in May, 1886. Twenty-two years before entrance he contracted a sore on the penis. The sore was cauterized. In the fall of 1885 a red bunch appeared in the scar, and this has been cauterized many times since because of its increase in size. Examination showed the glans penis to be nearly destroyed by epithelial growth.

My findings are substantiated by those of Cripps, who reports 1 case in which epithelioma developed in the scar of a syphilitic ulcer, and by Martin who cites a case developing in the scar of a chancre 9 years after the appearance of the initial lesion. Still another case is reported by Sibley of a man of 35 who had a chancre. This was entirely healed under specific treatment. When 62 years old a slight redness developed on the site of the chancre. This went on to ulceration and at the age of 69 years the man died of cancer. Demarquay places syphilis second in order of importance of the contributing factors, and records 10 cases of it out of a series of 59.

It will thus be seen that venereal disease, especially syphilis, undoubtedly plays a part in the etiology. I have found no

case that could definitely trace its origin to a chancroid, nor have I seen any mention of the subject in the literature.

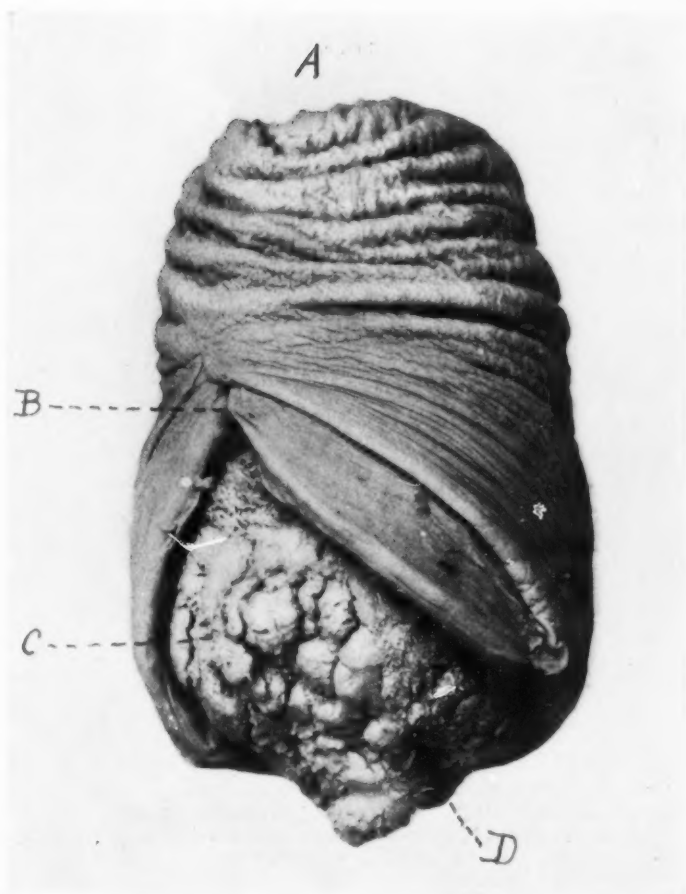
Trauma.—Only 13 of these 100 cases were questioned in regard to trauma. Three only, had had any definite injury. There were, however, 6 cases who had had previous circumcision for one reason or another, and who said that the wound of this operation had either never healed, or that the cancer had first begun in its edges. This surely is a form of trauma, and in these cases it was apparently the beginning of the trouble. We are forced therefore to give some value to trauma as an exciting cause of cancer.

CLINICAL COURSE OF THE DISEASE.

Character of the Growth.—There are according to all writers (more especially Jacobson) two types of growth, the cauliflower or proliferating, and the ulcerating, with indurated edges and rapidly destructive properties. Clinically it is frequently impossible to differentiate these two types on account of their mixed character, especially to be seen in those of long duration. This classification has been still more difficult to make from the imperfect records alone. In doing this many doubtful cases have been excluded. The rest arrange themselves as follows: Cauliflower-like growth, 46 cases (Fig. 1); ulcerative growth, 35 cases (Fig. 2). It is thus seen that the cauliflower growth is the commoner of the two. Thomson also takes this view.

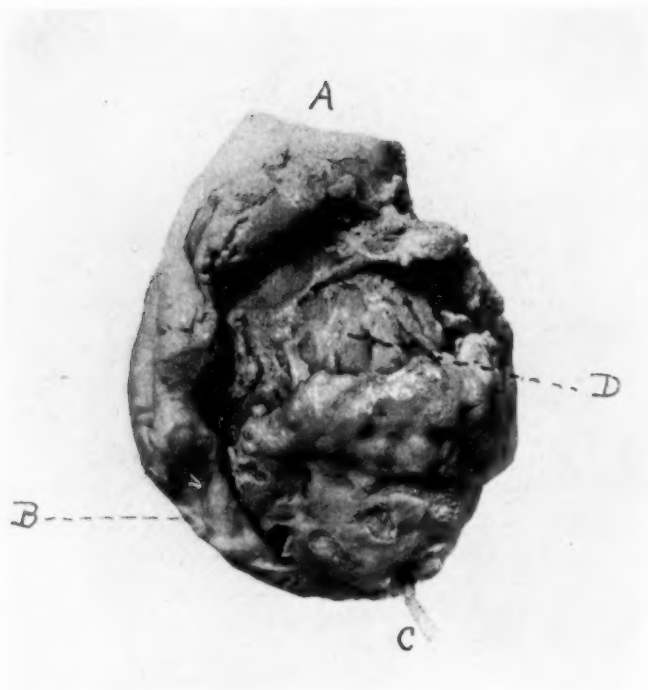
Condition of the Growth.—Inquiry as to whether the growth was ulcerated shows that in 77 cases where the fact was recorded, 65 were ulcerated, and 12 were not. From this it is readily seen that the cauliflower growth goes on to ulceration. It is scarcely necessary to say that all those cases which were ulcerated had a foul, sanguino-purulent discharge, but the large cauliflower growths were also bathed in a creamy, acrid secretion. A few cases gave a history of frequent hemorrhages from the growth, some being a mere capillary ooze, others being an affair of some severity from erosion of the erectile tissue.

FIG. 1.



Cauliflower growth, involving glans (C). Amputated extremity of penis at A, dorsal incision through prepuce at B. Meatus at D. Specimen from Warren Museum.

FIG. 2.



Ulcerative type of growth involving glans and prepuce (D). Amputated extremity of penis at A, edge of prepuce at B, meatus with bougie inserted at C. Specimen from Warren Museum.

FIG. 3.



Cancerous growth of both proliferative and ulcerative type involving glans and prepuce, but most especially the latter. Prepuce, A; glans, B; meatus distended by straw, C. Specimen from Warren Museum.

FIG. 4.



Growth of cauliflower type involving both glans and prepuce, but more especially the glans. Patient 52 years old, duration 2 years; urination through several fistulous openings in growth, small glands in groins. Amputation at pubes, both groins dissected. Death from apoplexy a few years later. Case of the late Dr. John Homans.

Starting-place of the Growth.—Demarquay says that these lesions start most frequently on the glans penis, while Thomson not only agrees to this, but localizes the growth to the dorsal aspect of the glans near the corona. He puts the preputial reflection next in order of frequency. Kaufmann, an indisputable authority, says that out of 33 cases he observed the growth 20 times on the prepuce, and 13 times on the glans.

My observations show that in 65 cases, where there was any definite statement on this point 45, or over 69 per cent., had started on the glans, while 24 had their origin on the prepuce (in its mucous membrane). Many had started in the sulcus behind the corona glandis, while others had started near the frenum at its junction with the glans. In a few cases the growth was still limited to its point of origin, but in most it had spread so as to involve both glans and prepuce (Figs. 3 and 4).

Urinary Symptoms.—It is quite reasonable to suppose that a malignant growth in the region of the meatus and the urethra should cause some urinary symptoms. As a matter of fact such symptoms were present in a majority of the cases in this series who were questioned on the subject. In 39 information on this point was obtained; in 22 there was a story of some abnormality of micturition; in 17 no trouble existed. These urinary difficulties included complete retention (only however in 1 or 2 cases where previous amputation had been done), frequency, burning, small stream, incontinence, and urination through fistulæ in the growth. Many, if not most of the symptoms, were undoubtedly caused solely by the disease, but some of them, such as retention, frequency, small stream, and incontinence might perfectly well have been due to prostatic hypertrophy (which doubtless was present in as large a per cent. of the men of this series as in any similar number of men of this age) or to stricture of the urethra. According to Demarquay retention of urine is not infrequent in cancer of the penis, but where the anterior urethra alone is affected, urinary fistulæ are established, whereby urine may escape. In none of these cases had the lesion begun in the urethra or even at the meatus, so that the urethral occlusion when it existed was due

to extension of the growth, to œdema of the parts, or to the contraction of scar tissue. In regard to this point Keyes says:

"Locally the growth may spread over quite a large superficial area without involving the corpora cavernosa, whose sheaths stoutly resist invasion, while it has frequently been noted that, though the entire glans may be involved in the disease, the corpus spongiosum is usually spared, and urination unimpeded. If, however, the canal does become obstructed the urine usually manages to find its way through one or more fistulous openings in the floor of the urethra."

I would say that urinary symptoms are practically all seen only in the later stages of the disease, when the growth has invaded the body of the penis and distorted the urethra.

The subsequent divisions of this subject will consider the cases in two groups, primary and recurrent. The former had never had a previous operation for cancer of the penis; of the latter all had been operated on once, some of them several times for the removal of the disease.

There were 74 primary cases, and 26 recurrent cases.

Duration.—In patients of the class which makes up the largest part of this series, accurate observation is rare. Furthermore in this disease which begins so gradually, so painlessly, and so entirely lacking in initial symptoms, there is room for much error as to the time of onset. I would further emphasize the difficulties of observing any growth under a congenitally tight prepuce, which many of these patients had, until it has gained very considerable headway. However such figures as have been obtained in regard to the duration of the disease are interesting.

Primary Cases.—Under 1 year, 38 cases; 1–2 years, 18 cases; 2–3 years, 5 cases; 3–4 years, 3 cases, 4–5 years, 2 cases; over 5 years, 4 cases; unknown, 4 cases. Total, 74 cases.

Recurrent Cases.—The figures of these cases are very similar to those of the primary cases, the time in both applying to the duration from the first symptom to the final operation recorded. Several cases had had more than one recurrence, to remove which attempts had been made at successive operations.

Under 1 year, 4 cases; 1-2 years, 7 cases; 2-3 years, 6 cases; 3-4 years, 1 case; 4-5 years, 1 case; over 5 years, 6 cases; unknown, 1 case. Total, 26 cases.

It is to be seen that in either column the figures tend to taper toward the middle, indicating either a very rapid or a very slow growth.

I wish to call attention especially to the important fact that while most cases have a duration of one, two, or three years, yet there is in this series a total of 4 cases with a duration of from 3 to 4 years, 3 cases with a duration of from 4 to 5 years, and most striking of all, a total of 11 cases of over 5 years duration. Many of these latter had existed for a very much longer time than 5 years.

The disease is therefore one whose duration is most uncertain, and in any given case it is practically impossible to say what the outcome is to be.

Another point of interest is that the two types of growth previously described have a different duration. Analysis shows the cauliflower-like growths to have had an existence of about 24 months, while that of the ulcerative type was only 16 months.

Pain.—Unfortunately the question of pain was considered in but 48 of these cases. In 21, or 43.5 per cent. pain was present, in 27, or 56.5 per cent., it was absent. Considered under the headings of primary and recurrent cases the figures are as follows: *Primary Cases.*—Present 16, or 44.5 per cent. Absent 20, 55.5 per cent. Total, 36. *Recurrent Cases.*—Present 5, 41.5 per cent. Absent 7, 58.5 per cent. Total, 12.

These figures although only approximate for each group of cases show a striking similarity, and it is to be noted that in each group pain was absent in a majority of the cases. It is therefore not a constant symptom, and in no case was it evident that it had been severe enough to cause much suffering. The pain was also not especially characteristic. In most instances it was sharp and darting, and was localized chiefly to the penis in the region of the growth. In other cases it was described as being felt mostly in the groins, testicles, or legs, and was of

a dull, dragging character. It was also noted that the pain of whatever character or intensity was one of the late symptoms, appearing in many only after the growth had existed for several years. This feature is best shown by the fact that the percentage of those having pain was even less in the recurrent, than in the primary cases.

Lost of Weight.—Information on this point was obtained in only 14 cases as follows:

Primary Cases.—Present 7, or 100 per cent. Absent 0. Total, 7.

Recurrent Cases.—Present 2, or 28.5 per cent. Absent 5, or 71.5 per cent. Total, 7.

The figures are too small in each group to be of much value, but such as they are it is interesting to see that a total of 9 had definitely lost weight. Of these, 7 were primary cases. In other words, loss of weight had occurred in every primary case where the fact was known. Five cases, all in the recurrent group, had not lost weight, a fact which is contrary to every expectation. "*Ubi gentium sumus.*"

Glandular Involvement.—In 66 cases note was made of the condition of the inguinal glands. They were pathologically enlarged in 50 cases or over 75 per cent., while in 16 no enlargement could be made out. The enlargement was mostly unilateral, and as a rule the glands were enlarged on the same side which the primary growth was on, but in not a few cases they were involved on the side opposite the lesion. This is explained by Keyes who says:

"The lymphatics of the penis so anastomose that a so-called cross-bubo, the sore on the one side of the penis, and the bubo in the opposite groin, occurs not infrequently."

It is well known that the disease is often slow in reaching the inguinal glands, and also that after reaching them it is as often equally slow in spreading further. In a case reported by Taylor the penis was amputated without removing the glands after the tumor had existed for 6 years, and the patient stayed well for 10 years more. That the glandular enlargement may be due to pyogenic, as well as to cancerous infection,

is shown by the fact that out of 20 cases in which the glands were dissected out, and in which there was a definite pathological report, 8 or 40 per cent. showed only simple hyperplasia due to absorption from the ulcerated and infected growth on the penis. The remaining 12, or 60 per cent., proved cancerous. Furthermore in several cases presenting glandular enlargement, where only amputation of the penis was done, the post-operative record showed that there was a marked diminution in the size of the glands. This was evidently due to the removal of the infected focus, but of course does not show that there was no malignant infection as well.

Practically all writers agree that invasion of the inguinal glands is more frequent than is generally supposed. In 48 cases examined by Kaufmann the inguinal glands were found to be free from cancer in only eight. Martin quotes Gussenbauer, who says that the inguinal glands are with few exceptions involved very early, and that even though not palpable, the microscope generally shows cancerous metastasis. In 48 cases examined he found the glands to be involved in 40, of which 30 were bilateral, and 10 unilateral. Kuettner found glandular enlargement in 71 per cent. of 60 cases, but in only 32 per cent. were the glands cancerous. He observed 16 cases with no recurrence after operation, and of these not a single case had glandular involvement at the time of operation.

A point of importance in regard to glandular involvement is that although there may be no demonstrable metastases in the inguinal glands, yet there may be internal metastases. Kuettner speaks particularly of this point. Certain cases in Von Bruns' clinic died of pelvic metastases after amputation of the penis and thorough dissection of the inguinal glands. Being unable to find an explanation of this in the anatomies, Kuettner made a number of injections and found that merely the superficial lymphatics of the penis empty into the inguinal glands, while the deep ones follow the blood-vessels and empty directly into the nodes situated in the pelvis. This is a point of the utmost importance in considering the prognosis. I know

of no way however of predicting this catastrophe, or of diagnosing it antemortem.

Paget said, "The diseased glands are enlarged, hardened, smooth-surfaced, and usually retain their natural connection with the surrounding tissues."

Modern observers go farther than that, for it has been found that in their progress the cancerous inguinal glands may gradually assume a form similar to one of the two types of growth on the penis, the cauliflower-like or the ulcerative. Two cases illustrating this phenomenon have been observed by Taylor. In the first case "the new growth in the glandular structures was very exuberant, and a very large, subcutaneous, lobulated mass was produced which caused ulceration in the skin. Though the superficies of the mass underwent decay its central portions retained their integrity. During its development there was erosion of one or more arteries." In the second case "it seems probable from the history that the cancerous glands underwent acute inflammation, that suppuration ensued, and that they were thus extruded. Around them the malignant action had established itself in the skin, or connective tissue, or both. The morbid process in the first case was quite sharply limited to the glands, with perhaps some secondary skin change, in the second case it began in the glands and destroyed them, then spread to the overlying and surrounding skin."

My findings agree with those of Patterson. He says that the inguinal glands are invaded both by inflammatory and cancer cells. Without operation these glands go on to suppuration, leaving large ulcers which are infiltrated with cancer and as malignant as those on the penis. Because of this double infection operative interference meets with three difficulties:

1. The free communication between the very numerous glands, and their intimate association with important structures.
2. The adherence of the glands to surrounding parts by inflammatory exudate.
3. The softening of the glands by inflammatory products which render their complete extirpation difficult. Small bits of

cancerous gland tissue are left behind, and these act later as foci of recurrence.

In connection with glandular involvement I note for the sake of completeness the

Involvement of the dorsal lymphatics of the penis.

In only 5 cases was the condition of these superficial lymphatics observed, but in all they were like hard, fibrous cords running up to the pubes toward one groin or the other. One of these was a recurrent case, the other four primary cases. In another recurrent case having 4 operations in as many years, a hard fibrous cord was noted running from the metastatic growth in the groin toward the umbilicus. As the lymph stream offers the principal channel by which metastases can occur in cancer, it seems strange that the lymphatics were not noticeably indurated in a greater number of cases. However as in many the entire penis was edematous and indurated as far back as the pubes, it would be easy for any one lymph channel to escape notice. Moreover it has been shown by Kuettner that the deeper lymphatics may be the only ones involved. It must also be remembered that the involvement of the superficial lymphatics may be only microscopical.

Thomson says in regard to this point that one of the 3 methods of backward extension of a cancerous lesion on the penis is by the main lymph channel in the dorsum. Later on however he says that in transverse sections of the penis, in cases in which the disease of the glans was well advanced, he was unable to observe cancerous emboli in the lymphatics, like those demonstrated by Stiles, in the lymphatic vessels running from the breast to the axilla in cases of mammary cancer. In other words Thomson says there was no anatomical explanation, in the specimens studied by him, for the early infection of the inguinal glands.

I would add that as the cancerous growth on the glans is usually infected by pathogenic bacteria, this fact in itself might account for the induration of the lymphatics.

Evidence of Internal Metastases.—Those metastases (beyond the inguinal glands) which were demonstrable at the

time these cases were seen, were all limited to the pelvic organs. In two cases the entire spermatic cord was much enlarged and indurated, especially its inguinal portions. In 5 cases there was unmistakable clinical evidence of cancerous growths in the rectum, prostate, and vesicles, and in one of these cases, the whole perineum was riddled with sinuses and cancerous nodules.

As regards metastases in the abdominal and thoracic organs and the central nervous system, it is said by all writers that such deposits are exceedingly rare. As I have said before no case in this series had such metastases demonstrable when seen.

According to Kaufmann the internal viscera have been seen to be secondarily infected by Von Winiwarter, Ricord, and Louis each in one case, and by Lebert in two cases. Curtis, Kuettner, Wilson, and Kocher each report a case with autopsy, making only 9 cases in all, so far as I have seen in a comparatively scanty literature.

In this series so far as known, one case in the recurrent group, and four cases in the primary group dying of cancer, had internal metastases. In other words, over 15 per cent. (32 of these 100 cases died of cancer) had metastases in the vital organs. This is contrary to the statements of other writers, and we can say that internal metastases are by no means uncommon. Unfortunately I have no knowledge of any autopsy on any of these cases who died of cancer. The diagnoses were clinical, made by the attending physician. In one case a large mass was felt in the region of the gall-bladder.

In the cases reported in the literature metastases took place in the central nervous system, lungs, heart, liver, and stomach.

It is fair to say therefore that death in epithelioma of the penis results usually from general cachexia, induced by inguinal or pelvic metastases, but in over 15 per cent. of cases it is due to invasion of some vital organ.

Implantation of the Growth.—In one case there was a large cancerous ulcer on the scrotum, arising from contact with

it of the lesion on the penis. This, together with the fact that in a large majority of these cases the cancerous process had spread from glans to prepuce, or vice-versa, illustrates the ease with which cancer is implanted on adjacent parts.

PATHOLOGY.

Epithelioma of the penis may begin in one of several ways.

1. As a simple wart. Kaufmann states that in 29 out of 33 cases he saw the disease begin in this way. Nine cases of this series are known to have commenced thus.

2. As a "pimple," in which case it is usually situated near the lymphatics. Nine cases had this origin.

3. As a superficial excoriation or raw patch. There were 4 cases of this.

4. More rarely as a true ulcer. Eight cases started in this way.

5. Very rarely begins in the urethra (*i.e.*, meatus) or spreads to the penis from the scrotum. In 134 cases Demarquay found the urethra involved only twice.

Fifteen of this series said that the trouble began with a hard, smooth "lump" which progressed more or less rapidly to its final form. Two cases noticed first a little "scab" on the glans; two others had their attention first called to the trouble by a sanguino-purulent discharge from under the foreskin.

Thomson has something to say in regard to the existence of precancerous conditions of the epithelium of the penis. It may present one or both of the following changes:

1. A catarrhal condition (balanitis) in which the surface layers are shed, the deeper layers are permeated by leucocyte infiltration, and the subjacent connective tissue shows great increase in vascularity.

2. More frequently a marked thickening of the surface epidermis, along with a rich infiltration of small cells in the sub-epithelial connective tissue. The overgrowth of surface epidermis may be uniform or papillary, or may present complete branched filiform processes. It ceases abruptly at the edge of

the cancer. These conditions of surface epidermis are similar to those observed in the lip and tongue in association with cancer, and have been described by Schuchardt and others under the name of "psoriasis preputialis."

Epithelioma is practically the only form of cancer attacking the penis. Its microscopic appearance is that of any squamous-cell cancer, and I have nothing further to add in regard to it. As already shown it may assume one of two forms, the cauliflower-like, or the ulcerative. Its manner of growth when attacking the inguinal glands has also been touched upon.

A case of "medullary cancer" of the penis is described macroscopically and microscopically by Kilgarliff, occurring in a man of 55. The duration was four months. Gould reports a case of melanotic epithelioma of the penis occurring in a man of 75 years, with 5 years duration. Both Paget and Billroth described such a growth, but it is evidently an almost unheard-of thing. Medullary cancer of the penis occurs apparently with equal rarity.

MODE OF EXTENSION OF THE DISEASE.

Although I can say nothing from personal observation about this matter, I think it worth while to state that there is still a good deal of uncertainty on this point. So great an authority as Kaufmann could find no evidence of penetration of cancer in the erectile tissue spaces. Thomson takes an opposite view, and mentions a specimen in the Hunterian Museum in London which proves his point. It is undoubtedly true, however, that the stout fibrous sheaths of the corpora cavernosa resist invasion for a very long time, but the late invasion of erectile tissue may be accounted for also by the tendency of the growth to proceed in the line of least resistance, heaping layer upon layer on its surface, forming the cauliflower mass.

The disease extends backwards in one of three ways.

1. By extension along the main lymphatic vessels in the subcutaneous tissue of the dorsum of the penis, and continuous with the primary growth.

2. Penetration (in time) of the erectile tissue by epithelial prolongations, forming continuous cancerous infiltrations of the blood spaces.

3. More rarely by the development of outlying foci, or secondary nodules of cancer in the erectile tissue, perhaps at some distance from the primary growth.

The last two types of the extension of the disease were shown fairly well by the experiments of Kuettner previously mentioned.

The first type shows that amputating the penis by leaving a dorsal flap should be abandoned, for in making the latter the main lymphatic trunks are included.

An examination of many specimens by Thomson shows that as a rule the cancer tends to be localized for a long time to its original site, and that so far as local recurrence is concerned, it should be easy to prevent this by an early amputation. Epithelioma originating in the prepuce itself, shows the least tendency to extend backwards along the body of the penis.

RECURRENT CASES.

As stated above there were 26 recurrent cases in this series. A few had had more than one operation for the removal of the growth. Horteloup says that recurrence usually takes place during the first year after operation, but that it has been seen during the second year. Guyon cites a case occurring after 3 years.

My figures are as follows: Under 1 year, 12 cases or 39 per cent. Some had more than one recurrence. 1-2 years, 6 cases or 19 per cent. Some had more than one recurrence. 2-3 years, 5 cases, or 16 per cent. 3-4 years, 2 cases or 6 per cent. 4-5 years, no cases. Over 5 years, 4 cases or 12 per cent. Unknown, 2 cases. Total, 31 cases.

I wish to call special attention to the fact that in these 26 cases, 2 or over 6 per cent, recurred between 3 and 4 years, and 4 cases or over 12 per cent. recurred over 5 years after operation. These figures offer a striking contrast to the statements of other men.

Region of Recurrence.—Local (i.e., in the penis or its stump), 21 cases; groin alone, 2 cases; local and groin, 3 cases. Total, 26 cases.

Previous Operations.—Amputation alone, 7 cases; amputation with dissection of groins, no cases; circumcision, 13 cases; excision of the growth, 12 cases; dissection of the groin alone, 2 cases. Total, 34 cases.

Thus 34 operations were done on 26 cases. It is to be noted that palliative operations such as circumcision and excision, were by far the most numerous, and that there was no recurrent case having the radical operation of amputation with dissection of the groins.

Final Operations.—Amputation alone, 16 cases; amputation with dissection of groins, 4 cases; dissection of groins, 2 cases; excision by curette or cautery, 3 cases. Total, 25 cases.

One man refused operation and "eloped," dying over 6 years later of "phthisis."

In this group it is to be observed that the more radical operations are preponderant.

End Results (of Recurrent Cases).—Living (without recurrence) or cured, 11 cases, 42 per cent.; deaths from cancer, 10 cases, 38.5 per cent.; deaths from other causes, 4 cases; unknown, 1 case. Total, 26 cases.

Living (Without Recurrence) or Cured Cases.—In this group of 11 cases I have put 3 about whom there is a possibility of error, but whom I personally consider as cured. Two cases were seen, one 4 years, and another 8 years after operation by Dr. M. H. Richardson, of Boston, and were found to be perfectly free from any sign of cancer. They both died several years later, one of "cystitis with ascending pyelitis," and another of "emphysema of the lungs," and at an advanced age. The third case died 9 years after operation, of "heart disease," in old age. So far as known there was no recurrence.

Of the other 8 cases, I have either seen or corresponded with 4, and of the rest I have heard from their physician or near relative.

The operations done on those in this group are as follows:

Amputation with dissection of groins, 1 case; amputation alone, 8 cases; excision, 2 cases. Total, 11 cases.

The pathological report on the cases in this group is as follows: Specimen from penis malignant, 10 cases; glands from groin malignant, 1 case. Total, 11 cases.

The average length of life of those in this group (after operation) is about 24 years. One man is alive now, 30 years after operation.

Cases Dying of Cancer.—In these 10 cases recurrence is known to have occurred as follows: Inguinal glands, 2 cases; pelvis (rectum, perineum, etc.), 1 case; internal (liver), 1 case.

The operations done on these 10 cases were as follows: Amputation with dissection of groins, 2 cases; amputation alone, 5 cases; dissection of groins alone, 2 cases; excision (curettage of cancerous nodules in perineum), 1 case.

A pathological report was made in the excised specimens from these cases as follows: Specimen from penis malignant, 7 cases; glands malignant, 3 cases; glands non-malignant, 1 case.

The length of life of these 10 cases from the time of onset of the disease was about 8 years and 3 months.

The length of life after final operation was 4 years and 2 months. Two cases lived only 8 months after: 1 case lived 15 years and 5 months after!

Of the cases dying of other causes there is little to be said, except that there was no death immediately following the operation.

Primary Cases.—The final operations done on these cases were as follows: Amputation, 46 cases; amputation with dissection of groins, 16 cases; excision, 5 cases; circumcision, 2 cases; meatotomy, 1 case; no operation done, 4 cases. Total, 74 cases.

In three of these cases where amputation was done, the scrotum was split, and the urethra planted in the perineum. Total emasculation was done in no case.

The end results of these cases are as follows: Living

(without recurrence) or cured, 27 cases, 36.5 per cent.; deaths from cancer, 22 cases, 29.0 per cent.; deaths from other causes, 15 cases; unknown, 9 cases; living without operation, 1 case. Total, 74 cases.

Living (Without Recurrence) or Cured.—As in the recurrent group, I have included in this list of 27, 13 cases dying of other cause over 5 years after operation, in whom it is reasonably certain that a cure was established. Of these, 2 were seen by Dr. M. H. Richardson at intervals of 7 and 8 years respectively after operation, and were found to be perfectly well. They died many years later, one of pneumonia, and one of old age. The other 11 cases are those who died over 5 years after operation of other causes than cancer, and of diseases which apparently were not due to internal metastases. These diseases include old age, pneumonia, phthisis, and heart, and kidney affections. As it was shown in the analysis of the recurrent cases, that one died of cancer over 15 years after operation, and that 4 cases had recurrence 5 years, or over, after operation, one might say that it is unsafe to consider any cases cured unless proved by autopsy. But my point is that these cases apparently lived a natural life, which was terminated by other cause than cancer.

Most writers on the results of operations for cancer, have set a three-year limit as the time which must elapse without recurrence, before a cure can be said to have been made. Recent careful investigations by others, and the results obtained in this series of cases, forces us to lengthen this limit to at least 5 years. As a matter of fact my observations make me hesitate to set any definite time-limit.

The operations done on these 27 living or cured cases were as follows: Amputation, 20 cases; amputation with dissection of groin, 5 cases; circumcision, 1 case; meatotomy (for stricture in stump of penis which had previously been amputated), 1 case. Total, 27 cases.

One man refused operation and "eloped." He is still alive, although the disease began over 11 years ago.

A pathological report was rendered in these cases as fol-

lows: Specimen from penis malignant, 17 cases; glands from groin malignant, 1 case; glands from groin non-malignant, 3 cases.

Cases Dying of Cancer.—The operations done on these cases were: Amputation with dissection of groin, 5 cases; amputation, 13 cases; excision, 1 case; no operation done, 3 cases. Total, 22 cases.

The pathological report of these cases is as follows; Specimen from penis malignant, 15 cases; glands malignant, 1 case; glands non-malignant, 1 case.

Unfortunately I know about the site of recurrence in but 9 of these cases; Local (*i.e.*, stump of penis), 1 case; inguinal glands, 4 cases; internal (stomach and liver), 4 cases.

The average length of life *after the onset of the disease* was 3 years and 4 months, the shortest being 9 months, the longest 10 years and 5 months.

The average length of life *after operation* was 24 months, the shortest being 2 weeks, the longest 9 years and 3 months.

Here again there is little or nothing to be added about the cases dying of other causes, except that one died of sepsis in the hospital, to be considered, if you please, as an operative mortality of 1 per cent.

OPERATIVE SEQUELÆ.

Demarquay gives the following list of untoward operative sequelæ: 1. Retraction of stump. 2. Retraction of urethral orifice with abscess and fistula of stump. 3. Infection (bacterial) of inguinal glands. 4. Recurrence. 5. Generalization of the affection. 6. Aggravation of poor general condition. 7. Mental changes. 8. Loss of sexual power.

Skill or good fortune averted many of these unpleasant consequences in this series. Two men had had the penis amputated before coming to the hospital. Each had a stricture of the meatus of the stump, and this was divulsed. The urethra of one of these cases was packed full of small, faceted calculi, and a second amputation was done.

None of the cases that I saw or heard from, laid any stress on the loss of sexual power. In fact many denied such a possi-

bility, and in them it was apparently only a curtailment of their powers. Fortunately this disease and its radical treatment comes at a time when sexual matters are usually not uppermost in the mind.

Some writers, notably Demarquay, say that patients whose penis has been amputated are often seized with profound melancholia, and several suicides from this cause are reported. This depression has been absent, so far as known, from all these cases. On the contrary the tone of their letters, or statements, was one of joy at the new lease of life which the operation had given them. It must be born in mind, however, that the cases on which Demarquay based his observations were of an emotional race, in whom mental instability is not uncommon. The cases composing this series were, as a whole, of an entirely different type.

CONCLUSIONS.

1. Epithelioma is practically the only kind of cancer attacking the penis, and its frequency forms only from 1 per cent to 3 per cent of all cancers.

2. It occurs most frequently during the fifth, sixth, and seventh decades of life.

3. Phimosis is preëminently the most important of its exciting causes, occurring in over 85 per cent. of cases. Circumcision, therefore, cannot be too strongly advised, especially after middle life, in all cases where the prepuce cannot be easily and completely retracted. Syphilis and trauma are to be considered next in importance from an etiological standpoint.

4. Most cases seek relief during the first and second years of the disease, but it is not unusual to see cases of from five to fifteen years duration.

5. Pain occurs in 43.5 per cent. of all cases. It is rarely severe, and usually occurs late in the disease.

6. Enlargement of the inguinal glands occurs in over 75 per cent. of all cases. In 60 per cent. these glands are cancerous. The rest show simple hyperplasia from septic absorption.

Glandular involvement may occur early, but from my

FIG. 5



Showing result of amputation of penis at pubes. Groins not dissected. Meatus lies at bottom of dimple in folds of scrotum. Urination free, urine ejected several inches from body, enabling patient to stand at the ordinary urinal. No recurrence after 12 years. Case of Dr. A. T. Cabot's.



study of these cases I am inclined to regard it rather as of late occurrence.

Inguinal metastases cause death sooner or later. If well advanced, attempts at their removal are to be considered only as "surgical vandalism."

7. Invasion of the vital organs occurs in over 15 per cent. of all cases. It may occur without involving the inguinal glands.

8. Recurrence takes place up to one year after operation in over 39 per cent. of cases, up to two years in over 19 per cent., up to three years in over 16 per cent., up to four years in over 6 per cent., and, most notable of all, it occurs over five years after operation in over 12 per cent. of cases.

Its site depends largely upon the original operation performed, and will be local where only palliative operations have been done. It may occur several times.

9. The operative mortality is 1 per cent. This case died of sepsis, a misfortune which might occur in any operation.

10. The gross mortality is 32 per cent. That of the primary cases is 29 per cent., of the recurrent cases 38.5 per cent.

11. Thirty-eight per cent. of all cases are cured; of these the primary cases form 36.5 per cent., the recurrent cases 42 per cent.

12. Early amputation of the penis at the pubes with thorough dissection of the groins is the operation of choice. If taken in the earliest stages, however, amputation alone may effect a cure. The operations of splitting the scrotum and transplanting the urethra into the perineum, or of total emasculation, offer no greater hope of cure.

13. The length of life from *time of onset* in primary cases is 3 years and 4 months; in recurrent cases it is 8 years and 3 months.

The length of life after *final operation* in primary cases is 24 months; in recurrent cases 4 years and 2 months.

Cases may live for over 11 years after the onset of the disease without operation.

14. Sexual power is not necessarily destroyed by amputation of the penis.

15. Melancholia (in this country at any rate) rarely, if ever, follows the loss of the organ.

16. Amputation, even close to the pubes (Fig. 5), does not necessarily cause any disturbance of micturition.

17. The patient will be confined to the hospital for about 14 days after the radical operation.

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THE "BOTTLE OPERATION" METHOD FOR THE RADICAL CURE OF HYDROCELE.

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Professor of Surgery in the Northwestern University Medical School.

OPEN operations for the radical cure of hydrocele may be classed as of three types:

1. Packing or tamponade of the sac, causing adhesive inflammation.

2. Resection of the sac or portions of it.

3. Eversion or backward suturing of the two halves of the bisected sac.

1. "*Seton*" or *Open Packing*. "*Volkmann's Operation*." The earliest use of the packing method contemplated or always caused suppuration, as it preceded the antiseptic era. Later, when aseptic methods prevailed, it was found that sterilized gauze packing would bring about the same result, an adhesive inflammation between testicle and sac wall, without micro-organisms. This, to be effective, must go to the extent of causing somewhat intense irritation of the serosa and swelling of the scrotum, disabling the patient for rarely less than two or three weeks. The thickened parietal and visceral layers, while in process of obliteration, cause enough reaction to be somewhat painful and to require recumbent treatment. The method, nevertheless, is a very reliable one.

2. *Excision of Sac Wall*.—It requires less severe reaction—theoretically, none at all—to cause plastic union between one serous surface and the dartos or connective tissue, hence if the outer layer of the hydrocele sac be excised, and the visceral or that covering the testis remain, an excellent cure is obtained quickly. This led me, and no doubt many operators independently, to practice cutting off the two leaves or halves of the bisected sac, so that we have reports of numerous excision operations, usually attended with success.

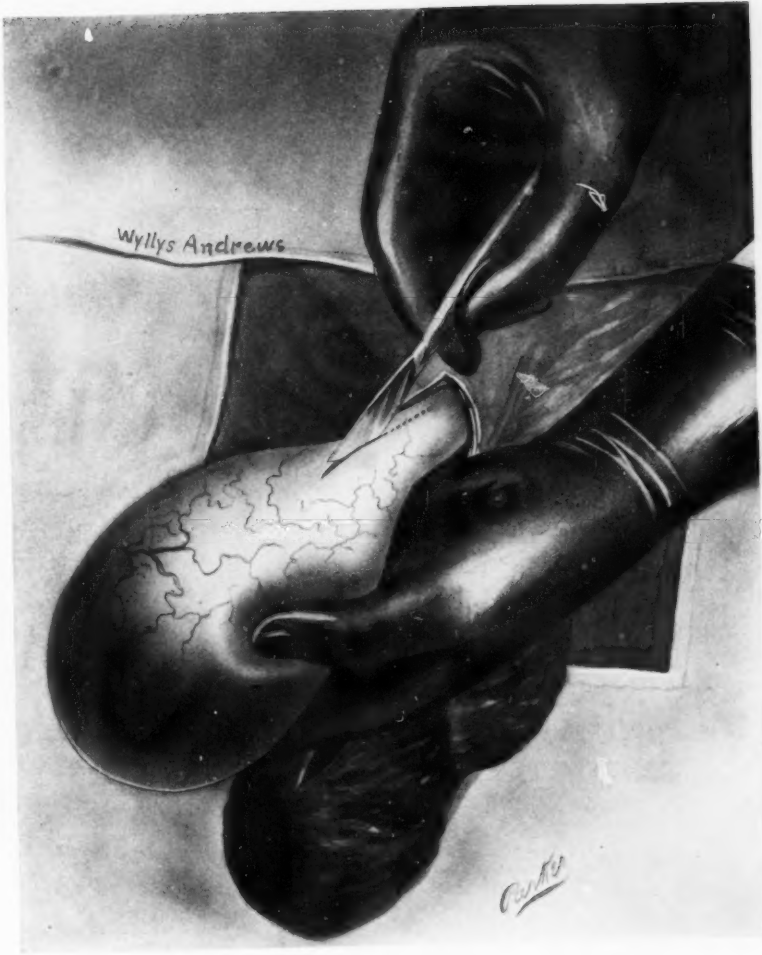
Practically, excision of the sac is too bloody to be called a neat and rapid method. The bisecting cut along the anterior median line is bloodless, but the lateral cuts, dividing the halves of the serous sac from their junction with the epididymis, cross rarely less than half a dozen vessels, requiring separate ligatures. This, with the staining of the tissues it involves, takes away all the neatness and speed of the operation. The results of this method are satisfactory, if great pains are taken not to leave any fringes of loose sac wall large enough to form new pouches. Hydroceles sometimes recur in a mysterious way from this error, and also from overlooking funicular pouches above the testicle.

3. *Eversion of Sac*.—When Jaboulay's method (sometimes also called Winkelmann's method in Germany) was published, my attention was very favorably called to it, and I have never had anything but encouraging results from its employment, barring one case of recurrence which I cannot explain. I have heard uniformly good reports of it in the hands of Dr. Ferguson and others here. Dr. McArthur alone criticised it as causing too much reaction, swelling and pain. My own cases have showed less soreness and shorter confinement than with any other technique.

The method consists in first bisecting the sac by a vertical incision along its anterior convex surface after isolating the whole mass from the dartos and lifting it outside the scrotal skin. The two flaps or halves thus formed are then everted and brought together back to back behind the globus major and epididymis, so that the whole serous lining faces outward. Anyone not a novice can make this entire dissection so nearly bloodless that the tissues do not become sodden or stained. The two everted flaps are now sutured together behind and all possibility of their reuniting into a closed sac is as effectually prevented as if they had been excised.

4. *Author's Method*.—A new technique which I have used exclusively in the past two and a half years seems to me such an improvement in certainty and speed that I recommend it without reserve, and do not hesitate to urge that it supersede

FIG. 1.



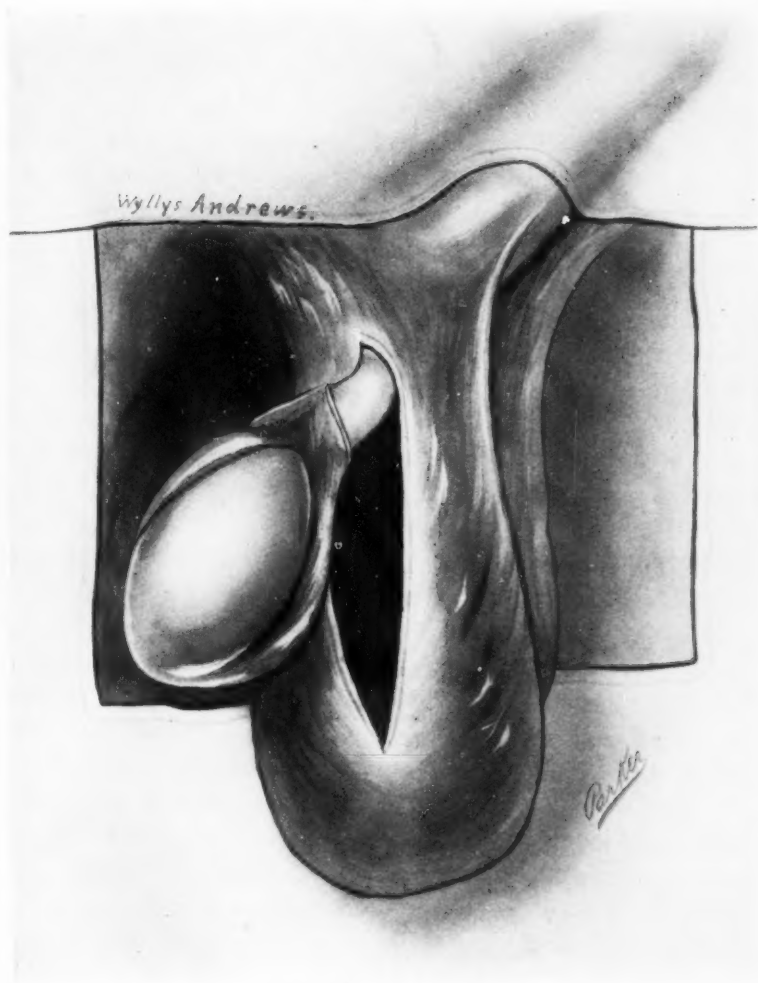
Hydrocele and testis enucleated. Incision at anterior upper portion.

FIG. 2.



Eversion of "bottle" by pushing testis through small hole in upper end.

FIG. 3.



Completely everted sac. The small anterior cut now takes a posterior position around the cord. No sutures required.

the older operations. The method, which I think is described very aptly by the term "bottle operation," brings about a complete eversion of the whole lining, without the use of stitches, and with much less cutting than the Jaboulay method.

TECHNIQUE OF THE "BOTTLE OPERATION."

An anterior scrotal incision is made as in the older methods. The skin should be held tense and the dissection should be nice to the exact layer which will enucleate the translucent bladder-like mass from its bed (Fig. 1). It is not an operation for a man over forty-five to attempt without glasses.

Careful study of the funicular part of the sac is now to be made. Usually a little funnel continues one or two cm. up the cord. The extreme upper end of this marks the beginning of the cut made into the sac. This cut is vertical, on the anterior border, and only about 2 cm. long (Fig. 1). We enlarge it a little by stretching. Sometimes it is wholly confined to the part over the cord. The incision in the sac is prolonged to its extreme upper end along the cord if the first cut did not do this. When the sac has been emptied, it is like a bottle or bag, with a small hole at the top. Dilating this slightly with one or two fingers, the orifice is held open and the testis is pushed up into it with the other hand or the two thumbs (Fig. 2). In a moment it can be squeezed through, and the whole sac will instantly be everted with the small buttonhole so closely surrounding the cord that it is scarcely visible (Fig. 3). The quickness with which this can be done will surprise anyone used to the older methods. It will also be seen at a glance that there is no possibility of the testis returning into the hydrocele cavity any more than with the suture method. The short incision contracts, so as to fit around the cord, and the whole sac by its elasticity seems to collapse around the epididymis with its white serous surface almost as smooth as that of the testis. I have never seen the everted sac voluminous enough to lie in wrinkles or folds, but no harm would result if it were so to act. Ordinarily, the largest hydrocele sacs when collapsed assume about the size of the testis, showing that

their walls remain perfectly elastic. As yet I have not tried my method on any very opaque, hypertrophied or thick-walled hydrocele. It is conceivable that some such old cases resulting from inflammations, injections or former operations, might be difficult to enucleate from the scrotum, or to evert after bringing outside the skin.

The skin is quickly closed with clips or light suture, without drainage. Such wounds heal within a week. The patients get about readily on the third or fourth day, sometimes earlier. The amount of swelling about the testis is usually small, even in double hydroceles. Tenderness and pain are moderate or absent, and no fever and malaise are felt after the second day.

This operation is very suitable for local anæsthesia, and therefore can be done on the aged without risk. Its results are in striking contrast with the old packing or open method, called in Germany Volkmann's method, but really of much older date. Koenig reports that the average confinement with this method was three weeks, and also that some patients were disabled fully as long by injection treatment, which also gives a very large percentage of failures.

No complications have occurred in a considerable series of these operations in our clinic, and, so far as we can learn, no recurrences. The recovery has without exception been rapid and practically painless.

BILATERAL TUBERCULOUS BURSITIS OF THE HIPS.

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ALTHOUGH tuberculous disease of the bursa over the trochanter major is not uncommon yet for both to be affected at the same time may be considered a rare event; the size and the remarkable symmetry of the two swellings in the case recorded below are also of interest.

R—, aet 8, a Hindu child, District 24 Perganas, was admitted into the Medical College Hospital, Calcutta, on June 3, 1904.

The history obtained was that a year previous to admission, he suffered severely from fever for a month or so; during the course of the fever he suddenly felt pain in the left hip which later became tender and began to swell. Two weeks after the onset of pain in the left hip, the same series of symptoms appeared on the right side. The swelling increased but the pain and tenderness diminished; at the onset of the pain some difficulty was noticed in moving the thighs but this rapidly disappeared.

The swelling on either side gradually increased and for a month or so before admission there was a return of the fever but at this time much less severe in type and characterized by a nocturnal rise. On admission, the boy was sparely built, emaciated and anæmic. Both the hips were seen to be much enlarged and the swellings were to all intents and purposes symmetrical, being somewhat pyriform in shape. Behind the tumor was smooth and globular and extended from the iliac crest above to the gluteal fold below; on the inner side it did not reach beyond the ilio-sacral articulation.

In front the swelling passed downward from the outer half of Poupert's ligament, the inner border being external to the femoral vessels and slanting outwards towards the insertion

of the gluteus maximus. On the anterior aspect the surface was more irregular, producing in places a bossy appearance. On the right side at the lowest point in front the skin was adherent over an area about the size of a half penny and here a hard nodule could be felt; elsewhere on both sides the skin was unaffected.

The swellings were tense and fluctuation could be readily obtained in any direction; the fluid was beneath the gluteus maximus.

Movements of the hips were free and painless in all directions except in extreme flexion when there was some limitation due to the size of the swelling. The gait was waddling and a little lordosis was present. The greatest circumference of the swellings was equal and measured $19\frac{1}{2}$ inches. A slight evening rise of temperature to 100° was present, and the patient was suffering from scabies. After a few days treatment with quinine and iron, operation was performed on the right side. A transverse incision was made extending inwards from the top of the great trochanter for about 4 inches, down to the gluteus maximus and this muscle was separated in the direction of its fibres; a large quantity of pus escaped with some masses of caseous material and many calcareous particles; the general effect being as if a quantity of mortar had been let out. Another smaller incision about $1\frac{1}{2}$ inches long was made below the anterior superior spine; through these incisions the cavity was thoroughly scraped with a sharp spoon and Barker's flushing curette; the irrigating fluid used being hot 1 in 5000 HgCl_2 . The incisions were closed with silkworm gut sutures, a small gauze drain being left in the posterior one. The wound healed by first intention and the general condition improved; there being no further rise of temperature.

Seventeen days later a similar operation was performed on the left side except that the posterior incision was made parallel to the fibres of the gluteus maximus and a third incision behind at the level of the crest of the ileum. The contents of the cavity were also similar.

In both cases the cavity was loculated and irregular; the

FIG. 1.



Bilateral tuberculous bursitis of the hips.

4

26

disease having extended a little way between the deeper muscles of the buttock. A careful examination of the great trochanters was made but no bone disease was discovered.

The further progress of the case was uneventful; the wounds healed by first intention, and he left the hospital on July 13. The greatest circumference of the hips then being right 16 inches, left 15 inches.

The photograph (Fig. 1) shows well the condition of affairs before operation. He returned to hospital in September with a small residual abscess on the right side which was treated in the same way; there was no further evidence of disease on the left side.

THE "SUSPENDER" ABDOMINAL BANDAGE. THE FOUR-TAILED GENITAL BANDAGE.

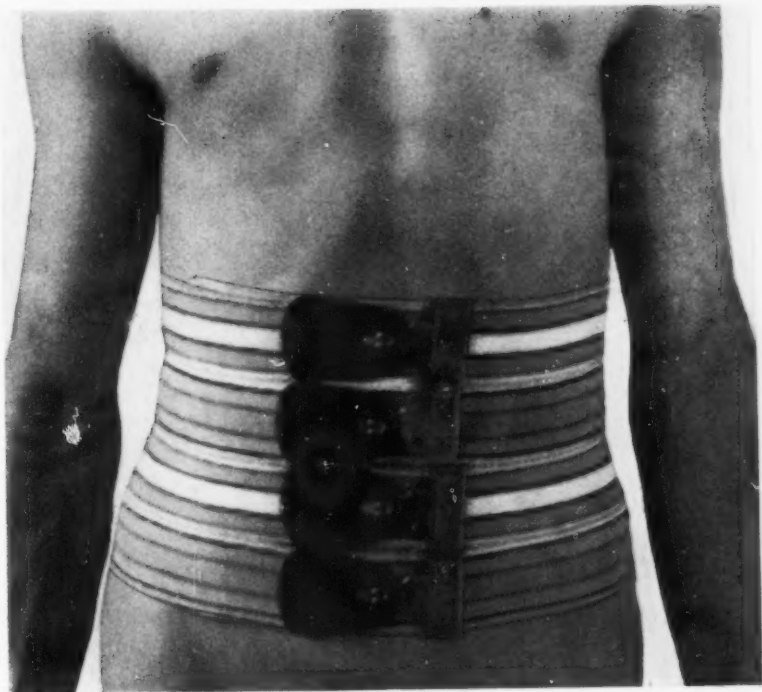
BY G. SHEARMAN PETERKIN, M.D.,

OF SEATTLE, WASHINGTON.

FIGS. 1 and 2 represent a bandage that may be employed after an abdominal operation to support the parietes. It is especially adapted to men who have to perform hard, manual labor; is economical, being made from two pair of Shirley suspenders, used by lumbermen (Fig. 3). These are ripped apart, their long borders approximated, and sewed together, the four ends where the buckles are attached being left free, so that they may be tightened or relaxed, that the binder may fit individuals of different sizes, or the same individual at different times. Moreover, it necessitates neither understraps or shoulder straps, as it does not slip up or down, because the lower border of the belt being placed below the anterior superior spines of the ilia embraces the crests and, the lower buckle being drawn more tightly than the remaining three (on the principal of adjusting a corset), the elasticity of the material maintains the belt in position.

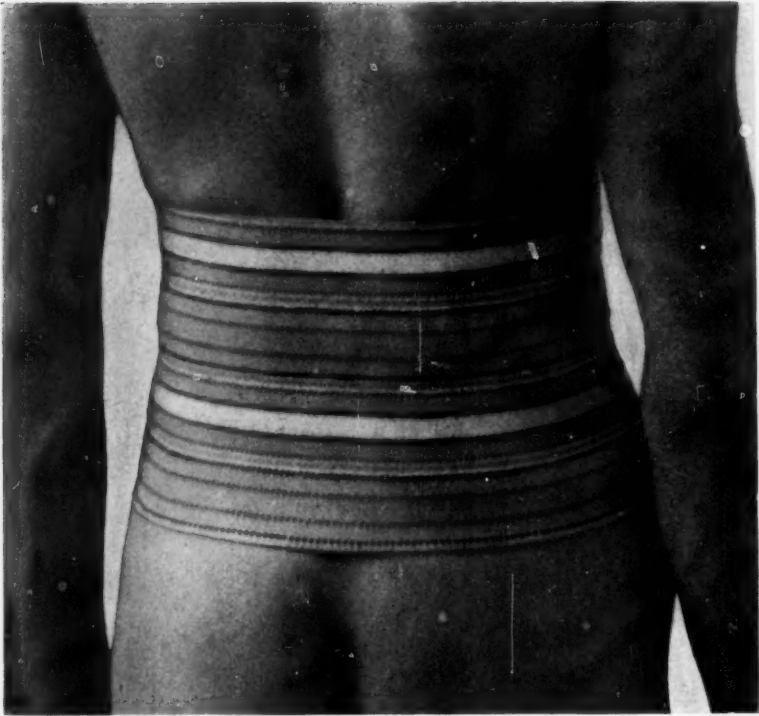
Figs. 4 and 5 represent a bandage devised and employed in inflammatory conditions of, or operations on or about the scrotum and testes. Its greatest recommendation is that it is easily made, simple and effective and requires no stitches or pins, as the illustration will readily demonstrate. The material is unbleached muslin. Directions for making are as follows: Length obtained by measuring from anterior superior spine of the ilium to the end of the external malleolus; breadth, one-half circumference of abdomen. After obtaining measurements, fold material once its greatest length; nick slightly at one end the folded border, thus dividing the material in two equal parts. While it is still folded, nick the two folded halves at the same end, so as to divide them in two equal portions,

FIG. 1.



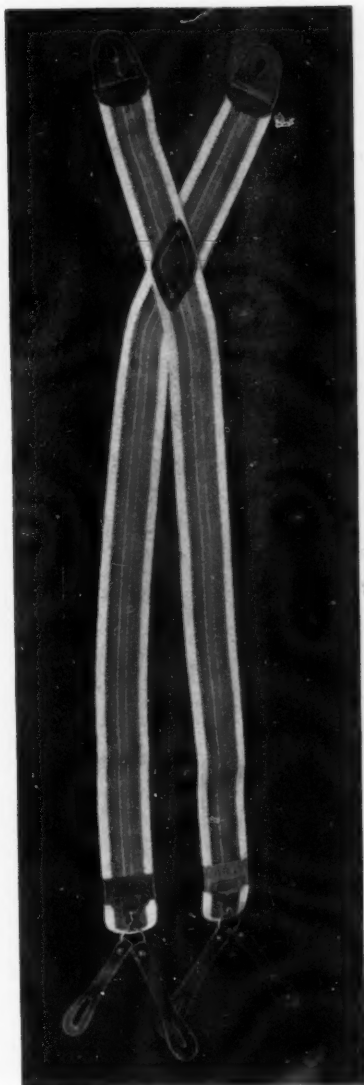
The suspender abdominal bandage applied. Anterior view.

FIG. 2.



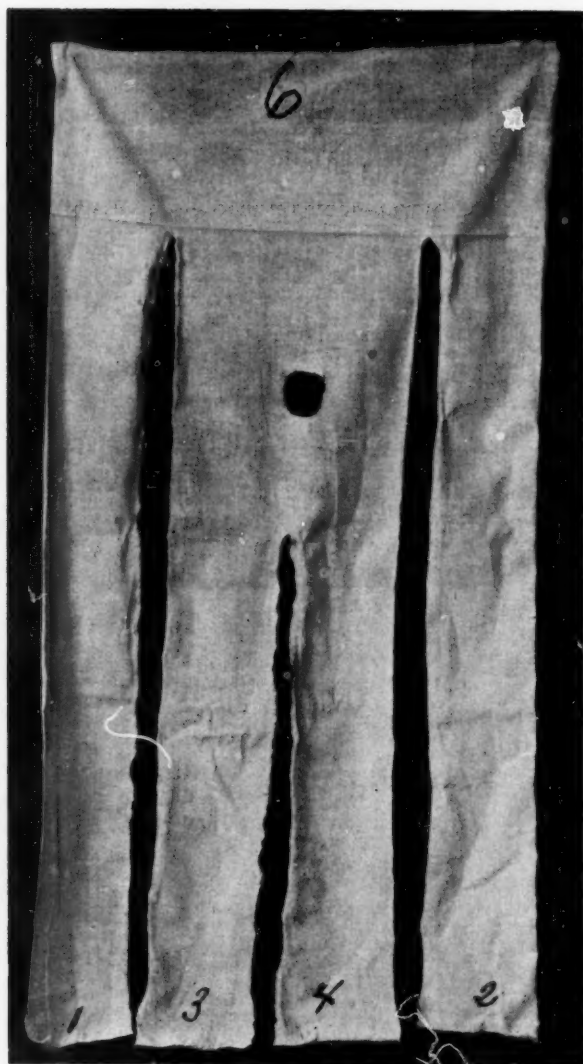
The suspender abdominal bandage applied. Posterior view.

FIG. 3.



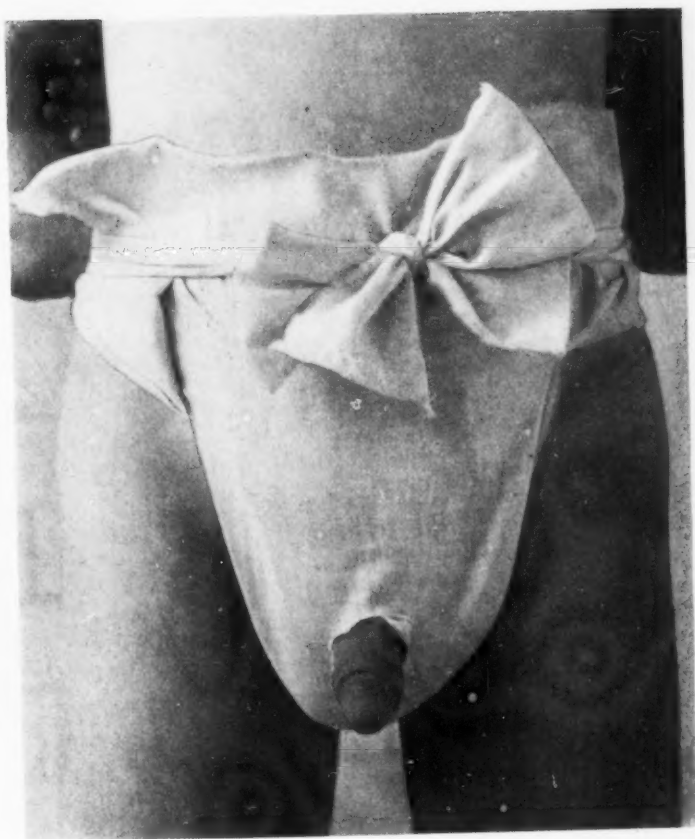
The common woven elastic suspender.

FIG. 4.



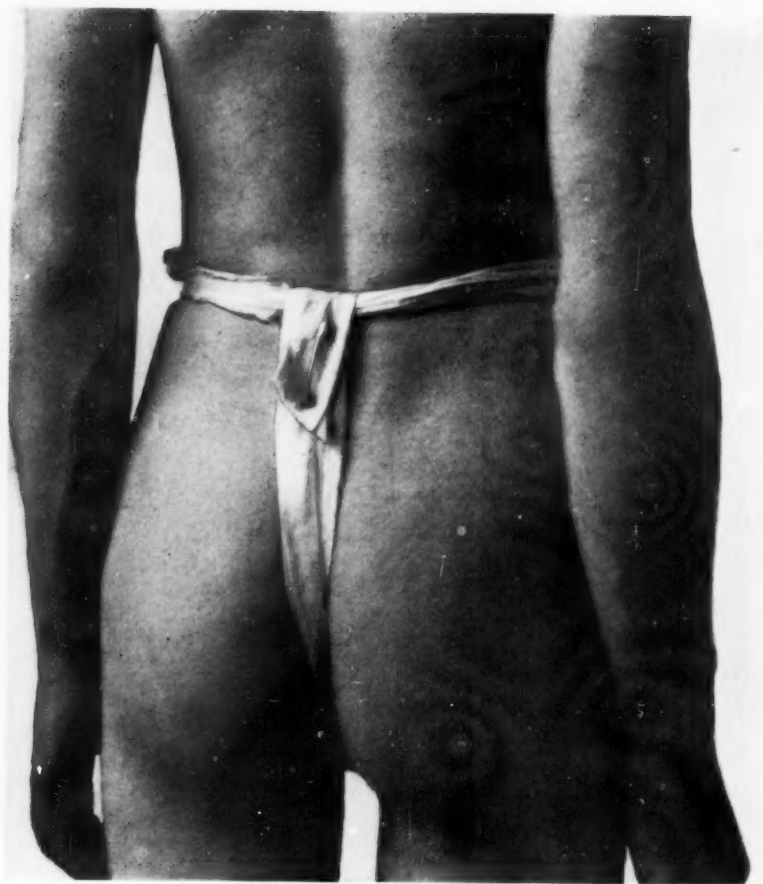
The 4-tailed genital bandage.

FIG. 5.



The 4-tailed genital bandage applied.

FIG. 6.



The 4-tailed genital bandage applied. Rear view.

making the material when unfolded a four-tailed bandage, whose tails are of equal breadth. Now tear the two outer strips, 1 and 2, as shown in the illustration, to within four inches of the outer end. Wind these about the waist from before backward so that they will cross at the spine; then tie in front (Fig. 5). Slit middle portion after bandage is applied so that the end of the tear will reach just behind the scrotum. While holding the bandage in position, place a fold of cotton back of the scrotum, so bandage will not chafe and will push testes forward. Also apply whatever other dressings may be necessary. Next, draw the two tails, 3 and 4, so as to overlap and form a pocket that will hold the testes snugly and then pass between the legs, over the perineum and tie at back or pin, as shown in Fig. 6, the pin being placed at the small of the back.

SURGICAL PROGRESS.*

GENERAL SURGERY, PATHOLOGY AND THERAPY.

I. Balsam of Peru as a Therapeutic Agent in the Treatment of Wounds.

SUTER, of Innsbruck, said: During the past two years we have introduced, in the surgical clinic at Innsbruck (Prof. Schloffer), the use of Balsam of Peru in the treatment of all recent open accidental wounds, in 562 cases in all. Among these were many injuries of the most severe nature, such as severe complicated fractures with extensive injury to both bones and soft parts. Concerning especially the complicated fractures of the long bones, which will probably be of the most interest, we present over 20 purely conservatively handled cases, omitting traumatic amputations, 1 case of primary amputation, and 2 cases which died shortly after the injury. Of these cases, 14 healed without complications and in only 6 was a secondary operation necessary on account of pus formation, for the most part without temperature elevation. Severe disturbances in the healing of the wounds did not occur in any case, in spite of the fact that there were some very severe compound fractures. In no case was secondary amputation necessary and we could always retain useful extremities.

The same favorable results were obtained in the treatment of extensive contused wounds of the soft parts; in crushed hands and fingers and in all lacerated wounds of the most varied nature. In all of these conditions, healing could be obtained without severe inflammatory processes, even though the wounds were badly lacerated, if the cases only came under our treatment within the first two days. It is important that the Balsam of

*Excerpts from the TRANSACTIONS OF THE GERMAN CONGRESS OF SURGERY, held in April, 1907. Translated by RALPH M. BEACH, M.D., of Brooklyn, N. Y. From the abstracts published in the *Beilage zum Zentralblatt für Chirurgie*, No. 31, 1907.

Peru be brought as evenly as possible into all the cavities and spaces of the wound.

Concerning the question as to how the action of the Balsam in accidental wounds is to be explained, I have caused exhaustive experiments to be made, and have come to the conclusion that there are three entirely distinct properties of the drug.

1. The ability of the Balsam to mechanically inclose bacteria, and in this way to eliminate the same as far as the organism is concerned. The defensive agents of the body have, of course, a better chance of acting successfully, the less poisonous material there is present.

2. Furthermore, the bactericidal properties of the Balsam play an important role. Even though they may be slight, such properties are undoubtedly present, as numerous experiments have shown. This slight bactericidal power is of great importance, however, taken in conjunction with the ability of the Balsam to inclose bacteria, as it gives opportunity for a longer continued action upon the same. The exclusion of the bacteria which was at first purely mechanical, becomes absolute after a time, inasmuch as they are killed. It is worthy of note that the Balsam of Peru acts not only as a bactericide, but also gives up into the vicinity, bactericidal substances, which fact I could also prove by experiments. Since the drug in contrast with soluble substances remains for a comparatively long time undissolved in the wound it thus forms, as it were a reservoir of anti-bacterial substances.

3. Finally, Balsam of Peru possesses to the highest degree positive chemotactic powers. In the neighborhood of a drop of the drug, which has been injected into the tissues, is formed a peculiar wall of leucocytes. When one now realizes that not only is the process of phagocytosis caused chiefly by the leucocytes, but that the latter, in all probability, stand in intimate relationship with the formation of those bactericidal substances of the body fluids, *e.g.*, the alexins, it appears justifiable to ascribe a certain favorable action in the process of wound healing to this enormous accumulation of leucocytes, caused by the Balsam.

In addition to these three main properties of the Balsam of Peru, namely—the “inclosing powers”—the bactericidal powers and the chemotaxis, should be noted, also the antagonistic action of the drug in preventing putrefaction in the dead tissues.

This latter power stands, of course, in intimate relationship with the properties described under 1 and 2.

As is well known, many varied reports, concerning the untoward action of the Balsam on the urinary apparatus, have been circulated. These concerned almost without exception cases of scabies treated by inunctions of the drug. We have made exact urinalyses in a great number of cases and have never found albumin present. In no case have we observed any disturbance in the general condition of the patient which could be attributed to renal irritation. Nevertheless special attention must be given to this question.

According to our opinion, the Balsam of Peru treatment, if applied in suitable cases, such as contused and lacerated wounds, gives better results than all other methods.

Through the results of our experimental investigations, the Balsam of Peru method of treatment has been placed to a certain extent, upon a scientific basis, so that its use can no longer be considered quackery. In all of our numerous cases, we have never noted renal irritation due to the Balsam. When such cases are reported it is very possible that the Balsam used was not perfectly pure. There are aromatic bodies, which even in slight traces, can irritate the kidneys. As is well known, the drug is often adulterated and the first requisite is to use only the purest Balsam.

BORCHARD (Posen) remarked that he could, in general, corroborate the favorable results in wound healing, from the use of Balsam of Peru, but that contrary to Suter, he had noted even after the use of relatively small amounts of the drug (3-4 grammes) albumin and casts in the urine, which disappeared after immediate suspension of the Balsam. The preparations used had been obtained from two different drug firms, and varied in their chemical composition only very slightly from the formula of the German Pharmacopœia. Continual careful urinalysis is therefore necessary in the use of the Balsam of Peru.

II. Iodoform-spermaceti Mixture for Filling Bone-cavities.

KOTZENBERG (Hamburg) reports concerning several cases, which have been treated in the First Surgical Division of the Eppendorf Krankenhaus according to the Mosetig-Moorhof method of filling bone cavities.

This method has, up to the present time, not found many adherents, probably due to the fact that the first attempts were attended by numerous failures. These were due mainly to improper technic, both in the use as well as in the preparation of the material used. Concerning the latter point, one must necessarily follow the directions given (*Wiener klinische Wochenschrift*, 1906, No. 44). If one does not have, at his disposal, a chemist well versed in bacteriological technic then one must undertake the preparation himself; for the results depend to a large extent upon the asepsis.

The bone cavities must of course be well cleaned out. K., to obtain this result, uses a set of instruments patterned after the boring instruments of the dentists. This is not absolutely necessary, however, as one can get along well with the ordinary chisels and curettes. The cavity is next disinfected according to the method of Phelps, and the warmed iodoform-spermaceti mass poured in. Here it is necessary to be careful that the mass has a temperature not over 50° C. and not under 40° C. In the former instance the iodine is separated out, whereas, if the mass is too cold it does not penetrate into the finer crevices of the bone.

Eleven cases were treated according to this method. Osteomyelitis gave naturally the poorest results: Of 7 cases, only 2 healed primarily, while 2 others after five weeks still have fistulæ with a cloudy serous exudate. In the 3 remaining cases, the covering over of the iodoform mass with periosteum could not be attained. One case gave up the treatment too soon. In the remaining 2 cases the cavity mass healed well, though erysipelas developed in the one. The other case is worthy of special note, because, though the patient had a marked idiosyncrasy against iodoform, there was absolutely no reaction.

Three cases of bone tuberculosis healed primarily. A bone cyst healed finally, also per primam.

Recurrences can of course occur in the tuberculous cases and fistulæ may remain after extensive osteomyelitis.

It is, however, not a new operation, but only a special method of caring for the wounds, which when compared with our previous experiences, certainly possesses the advantage of materially shortening the course of the disease, though it does not, after all, prevent the scars, which are a necessary consequence of the diseases in question.

HEAD AND NECK.

I. Traumatic Aneurism of the Carotis Interna Cerebralis
with Exophthalmus Pulsans.

BECKER (Koblenz) reported an instance of this very rare phenomenon in gunshot wounds of the skull in the case of a soldier. While he was discharging a gun, the barrel burst and some of the pieces of steel penetrated the brain. In the few cases (10), which up to the present time have been recognized, the seat of injury was diagnosed alone by the external symptoms of the pulsating exophthalmus. The diagnosis in our case, however, was made with absolute certainty by means of Röntgen photographs. The case will possibly possess, on this account, a certain interest. The patient was brought, in an unconscious condition, into the hospital, with four large wounds on the right side of the face, one passing through the nose and a second causing complete destruction of the right eye, which had to be enucleated. The left eye, the pupil of which was widely dilated from the beginning, developed at the end of ten days a protrusion and chemosis. The power of sight was so reduced that fingers could be counted only at a distance of 1 m. Marked restlessness with powerful gesticulations alternated with stupor during the first fourteen days after the injury. The protrusion of the left eye increased steadily and the mobility of the same decreased until at the end of three weeks the eye was immobile. The chemosis increased, the pulsation was both palpable and visible, and the veins of the upper lid became dilated and tortuous. Above the eye, over the left parietal region and over the entire head was audible a systolic bruit, which the patient was also conscious of, as a dull humming sound. By means of pressure one could force the eye ball back into the socket, but it would immediately protrude again if the pressure were released. Pressure on the left carotid caused the murmur and the pulsations to cease. Röntgen photographs of the head taken from the side, and also from before backward revealed the presence in the brain of three sharply defined shadows caused by portions of steel. By a combination of both negatives it was shown that one piece of steel about the size of a pea lay in the white matter of the right frontal lobe in the neighborhood

of the falx. A second larger portion, about 3 cm. long and 8 mm. thick, lay on the left side in the basal ganglia, with its long axis passing through the anterior portion of the nucleus caudatus from within and below diagonally upward and outward. The third portion was of the same form as the second, though thinner, resembling the portion of a pen which one inserts into the penholder. This portion lay on the left side of the sella turcica, extending from the anterior to the posterior processus clinoides, therefore at the point where the art. carotis int. passes through the sinus cavernosus. Here the injury to the artery had taken place and led to the formation of the arteriovenous aneurism with all the consequent phenomena of congestion in the veins of the orbit, dilatation of the valveless vena ophthalmica superior, protrusion of the eyeball, reversal of the blood current in the same and the consequent external pulsation. The treatment, which consisted in cool boric acid compresses with intermittent digital compression of the carotid against the spinal column, could in no way check the constant advance of the condition.

Therefore, in the fifth week after the accident, ligation of the left internal carotid was performed, whereupon the eyeball immediately receded, the pulsation ceased, and the bruit was no longer audible over the head. The patient withstood the ligation well and had no complaints, but during the next fourteen days a peculiar condition of somnolency overpowered him, so that he had to be awakened for his meals. It was not for a couple of weeks that he became completely awake and clear. Then, in spite of rest and the prevention of every form of exertion, there was gradually formed again a pulsating exophthalmus. These symptoms began to make their appearance fifteen days after the ligation. For four weeks the condition varied, improvement alternating with retrogression. Then, however, there was a marked increase in the symptoms and the exophthalmus pulsans recurred as completely as though an improvement had never taken place. Compression of the right carotid now caused the symptoms to disappear while compression on the left side had no effect.

I opposed the ligation of the right carotid in addition to that of the left, firstly, on account of the danger in general after such an intervention, and secondly, I hesitated on account of the untoward after-effects which the first ligation had caused in this man, whose brain was already severely injured. I therefore

sought by means of the following method of compression to cause an improvement in the symptoms.

I made a cylindrical tube of pasteboard about 10 cm. long which fit exactly over the circumference of the orbit. This I fixed exactly over the eye by pouring plaster of Paris about it over the forehead, cheek, and nose. Over the closed eye was placed a small boric acid compress, and into the tube I inserted a "pig's bladder," containing in its lower end 300 g. of mercury. The upper end of this "bladder," which was left untied, was filled with finely cracked ice. In addition to the pressure, the cold was supposed to influence by its constricting action the dilated veins. The patient could endure this pressure from six to eight hours, intermittently, each day, without any effect on his power of vision, which was continually controlled. In addition to this, digital compression of the right carotid was performed three times daily for an hour. By means of this continued treatment, to which was added absolute rest in bed, the prevention of any congestion, etc., the condition improved so much in five weeks that the patient had only a slight exophthalmus, no pulsation, no complaints, only slight ptosis, and could count fingers at 6 m.

The procedures in the treatment were gradually shortened and the patient was allowed to leave his bed. Five months after the recurrence of the condition, the man showed, in spite of the foreign bodies in his brain, the following status: bodily and mental condition normal, slight exophthalmus, ability to open and shut eye well, slight decrease in the mobility of the eye upward and downward, side to side movements normal, very slight ptosis, slight hypermetropia, acuteness of vision 5/20. The veins at the fundus were somewhat dilated and tortuous, but the arteries were normal, and no pulsation was visible in any of the vessels.

By comparing the case with those already in the literature I am induced to give the following resumé concerning the treatment: In young persons with traumatic exophthalmus pulsans, it is to be recommended not to wait long before ligation. Digital compression for fourteen days is advisable as a preliminary mode of treatment. With older individuals, however, the latter procedure should be tried for a longer period of time, and if possible not to resort to ligation. If there occurs, however, a relapse

and the symptoms can be caused to disappear by compression of the opposite carotid, then it might be advisable, in view of the untoward functional disturbances of the brain and sight attending double sided ligature, to recommend the attempt for a longer period of time with the method of combined compression.

II. Concerning Ligature of the Carotis Communis.

(New method for determining the consequences of the occlusion).

JORDAN (Heidelberg) said: Ligature of the common carotid still remains a dangerous operation since in 25 per cent. of the cases brain disturbances occur and in 10 per cent. fatal softening of the brain. The prognosis is, on that account, always doubtful and in the individual cases it is often left to chance whether the patient awakens at all after the narcosis, whether he develops a hemiplegia or perhaps dies of a progressive softening of the brain.

In order to prevent such undesirable surprises, the author recommends a new procedure, which proved itself of value in animal experiments as well as in an operation for carcinoma of the neck; namely, previous loose constriction of the carotid for forty-eight hours. By carefully constricting the artery by means of a small tape or catgut just until the peripheral pulse ceases, there is no injury to the intima and no clot formation. If one removes the ligature after two days, the peripheral pulse reappears and soon attains the normal strength.

This preliminary ligation must be performed under local anæsthesia since the cerebral symptoms may occur immediately after the narcosis and the determination of the onset be interfered with. If disturbances occur after the constriction one can immediately remove the ligature from the wound, which has been left open and the circulation restored to normal. By gradually increasing the constriction of the ligature one can, under certain circumstances, cause the development of a collateral circulation which may at first have been insufficient.

Finally the method may be used as an extra security in the suture of wounds of the larger arteries.

CASE.—Fifty-nine-year old man, with recurrent carcinoma of the right side of the neck.

Preliminary Operation.—Exposure under local anæsthesia of the carotis communis below the tumor, insertion under the artery of a gauze strip and the loose constriction of the vessel by means of double catgut.

No consequent symptoms, removal of ligature after forty-eight hours with immediate reappearance of the peripheral pulse. Four days after the preliminary operation, extirpation of the tumor with resection of the entire carotis communis external et internal, the N. nervus vagus, sympatheticus, the anterior cervical muscles and the overlying skin. No subsequent symptoms with the exception of contracted pupils and hoarseness. Normal course of wound healing. Exitus at end of three months from recurrence.

III. Supra Hyoid Pharyngotomy Preliminary to the Removal of Tumors of the Nose-Pharynx.

M. HOFFMAN, of Gratz. The difficulties in the removal of naso-pharyngeal tumors consist for the main part in the inaccessibility of the field of operation and in the profuse hemorrhage. There is a method, however, which allows the same general view, as the formerly used buccal and facial methods of exposure and lends itself better to hæmostasis. This consists in a transverse incision above the hyoid bone. Following the recommendation of Jeremitsch, this operation has been performed for various conditions. Von Hacker removed, according to this method a sarcoma of the base of the tongue. The view thus gained of the meso-pharynx, induced me to attempt, first on the cadaver, the removal also of tumors from the epipharynx. The important point in the use of this incision is to preserve the muscles attached to the lateral portions of the hyoid bone, in order to preserve the function of swallowing. By separating widely the walls of the opened and extremely elastic pharyngeal tube and pushing the soft palate forward, one may attain a good view of the base of the skull. This field may be materially enlarged by splitting the soft palate and the muco-periosteal covering of the hard palate in the median line, and after retracting these parts to either side removing the posterior portion of the hard palate, according to the method of Gussenbauer.

The removal, in a 27 year old woman of a sarcoma of the base of the skull by means of such a *pharyngotomia supra hyoidea transversa*, demonstrated plainly that the operation could be performed completely under control of the eye and with only slight hemorrhage. If one first controls the slight bleeding before incising the pharyngeal mucous membrane, no blood enters the pharynx as a result of the preliminary procedure. The tumor itself cannot be injured during this preliminary operation. If

the tumor bleeds more profusely during its removal, then the blood collects for the main part in the epipharynx and cannot possibly be aspirated, especially if a soft rubber tube has been previously introduced into the larynx for the anæsthesia. The bleeding points can now be tamponed under control of the eye, and in case of more profuse hemorrhage the ext. caxatia may be ligated by slight lateral prolongation of the incision. The cosmetic results of the operation, which may also be performed under local anæsthesia, are good since the scar lies in the most hidden part of the neck. The aspiration of blood during the operation can with certainty be prevented, so that a tracheotomy is unnecessary. The danger of an aspiration-pneumonia is certainly very slight, while the mechanism of closure of the larynx as well as its reflex excitability remains unimpaired. Since the hyoid bone is left in its natural position through the preservation of its laterally attached muscles, the mechanism of swallowing remains unimpaired. The normal anatomical relations are completely preserved. The patient operated upon by us could swallow well on the third day after the operation. This one favorable result does not suffice of course, for an absolute judgment concerning the usefulness of the method. One has to consider the size, site, and origin of the tumor in order to determine in each individual case the best mode of procedure. Still the assumption seems justifiable that the pharyngotomia supra hyoidea transversa makes possible the removal of naso-pharyngeal tumors under complete control of the sight and without the danger of profuse hemorrhage. By means of this operation the point of origin of the naso-pharyngeal fibromata, *e.g.*, base of the skull, is well exposed. In the case of malignant tumors, the operator has also the advantage that by means of slight lateral prolongation of the wound, he can convince himself concerning the presence of metastasis in the upper jugular glands.

SCHLOFFER (Innsbruck) had extirpated an adenoma of the hypophysis cerebri by means of the nasal method. The diagnosis was made by the Bitemporal Hemianopsia and a Röntgen photograph. The indication for the operation was continued headache, with very marked exacerbations. Although the patient had given his consent to the enucleation of an eye, if this should prove necessary, the removal of the orbital contents, which S. had at first thought advisable, proved unnecessary. The expo-

sure of the hypoph. cerebri through the sphenoidal veins was accomplished surprisingly easily after the entire nose had been drawn aside and the inner wall of one orbit and the antrum of Highmore removed. Between one quarter and one fifth of the enlarged cerebral appendage was left behind and the wound tamponed with Balsam gauze. There was a flow of liquor cerebro-spinalis for 14 days. No signs of meningitis three weeks after the operation. It is proven by this case that the extirpation of tumors of the hypophysis cerebri are much more easily performed through the sphenoidal sinews than one might expect, and that the much feared post-operative meningitis is not a necessary sequel.

THORAX.

I. Surgery of the Heart and Pericardium.

L REHN, of Frankfurt, A. M. 1. The presence of a cardiac injury is generally indicated by the site of the external wound, the course of the bullet or dagger and the nature of the hemorrhage. If an injury to the heart is suspected it is very important to note whether there are present symptoms of the so-called "heart tamponade" or "pressure on the heart," the latter being a term which analogous to "pressure on the brain," the author recommends to apply to that complex of symptoms due to an accumulation of blood in the pericardium. If the hemorrhage into the pericardium takes place rapidly, the pressure on the heart can lead quickly to death; whereas if it is more gradual, the the pericardium can expand, accommodating itself to the increased tension. The reserve spaces of the same become filled and there are formed the so-called Recessus pericardii, by means of stretching and greater prominence of the pericardial reduplications at the points of origin and exit of the blood vessels. Below and to the left there is formed a large recess, to the right side a smaller one and above the so-called "space of the dome." These recesses and their ability to dilate were demonstrated on an instruction anatomical preparation. The heart becomes gradually "strangled" through compression of the auricles and the venæ cavæ and it becomes exhausted under the increasing pressure. This exhaustion is due to a large extent to an improvement of the nutrition of the heart on account of the insufficient filling of the arteriæ coronariæ, and also an obstruction of the

exit of blood through the vena magna cordis. If no incision is made the heart eventually ceases to beat. "Pressure on the heart" causes characteristic subjective symptoms. It is important to note carefully any increase in the area of cardiac dulness. In an early stage, the Röntgen apparatus often shows an enlargement, which cannot yet be made out by percussion. The presence of cardiac murmurs, which may be varied in nature, is important in the diagnosis of cardiac wounds.

2. Concerning the question of operation interference in cases of cardiac wounds, spontaneous recovery does occur in a certain percentage of cases. However, a person with a sutured heart is undoubtedly in a better condition than one in which spontaneous healing has taken place. It is of course clear that immediate operation is indicated where there are threatening symptoms of cardiac pressure, or severe internal hemorrhage. Foreign bodies such as daggers, etc., which remain sticking in the heart, are to be removed only when the heart has been sufficiently exposed.

3. Exposure of the heart. The numerous methods by means of bone-flaps are too heroic and accompanied by danger of infection. A conservative mode of procedure is to be recommended first making an intercostal incision externally from the border of the sternum and corresponding to the external wound. If necessary, one or more ribs must be resected. If the heart is not yet sufficiently accessible, a second incision perpendicular to the first must be made along the border of the sternum. After cutting through the costal cartilages, the "osteo-cutaneous" flaps above and below are to be forcibly retracted and it may be necessary also to chip away a portion of the sternum. The survey thus gained, is very good. One shall attempt if possible to avoid the pleura or at least to prevent any gross injury to the same. A preservation of the pleura is generally impossible since the latter is generally opened by the initial injury. If possible the operation is to be performed with the Brauer apparatus or in the Sauerbruch chamber. An exploratory pericardiotomy is, under certain circumstances, indicated where the diagnosis is not certain. In this instance, the author recommends a particular method: an incision along the lower border of the seventh rib on the left side, toward the base of the ensiform, cutting through the seventh costal cartilage, gradual advance upward under the sternum to that portion of the pericardium, which is uncovered by pleura.

The sac is now easily opened and if necessary drained since tubes may be easily introduced into the same from either side. Starting with this wound, the necessary incisions for exposure of the heart may be immediately made.

4. Various methods have been used to control the often profuse hemorrhage during the suture of the heart such as tamponing the wound with the finger, compression of the entire organ, drawing on the heart toward the external wound, bending the heart over the border of the sternum. The author recommends compression between the fingers of the *venæ cavæ* at their point of discharge into the right auricle, in order to thus operate with a minimum loss of blood. He had convinced himself by means of experiments on dogs that this method was practicable and could be borne for a short time without injury to the heart. The suture of the heart is best performed with interrupted silk sutures.

5. The extensive statistics include 124 cases of suture of the heart with 40 per cent. recoveries. The points noted are the nature of the injury, the site of same on the heart, the cases operated upon "extra-pleurally," form of drainage with results, the complications in the successful cases, causes of death in the fatal cases (44 per cent. hemorrhage, collapse, 40 per cent. infection).

Concerning the question of drainage, the author recommends primary closure of the pleura, but drainage of the pericardium with rubber tubes. In addition to this, the author had collected from the various operators and reported statistics concerning the ultimate results on the operated cases.

Extract from the clinical history of a second case of cardiac suture, which the author performed in November, 1906. It was a case of very extensive stab-wound of the right ventricle Exitus 1½ days after operation.

ABDOMEN.

I. New Contributions Concerning Resection of the Liver.

DR. AUSCHÜTZ (Breslau). The material observed (20 cases from the clinics at Rostock, Königsberg and Breslau) showed that one could, in a very simple manner, attain good results in

the resection of even large portions of liver tissue. It is decried that complicated methods or unusual appliances are necessary in resection of the liver. (In all cases, single intraperitoneal operation, no foreign bodies left in the abdominal cavity). Only one case died as a result of the operation and that was due to either iodoform or chloroform poisoning. In the resection of liver tissue, the important question is the ligation of the branches of the portal vein and of the artery. That this is possible is proven by the experiments of Kusnetzoff and Penski.

In resections one can simplify the ligation of these vessels in two ways. 1. By making a clean, smooth incision through the liver tissue. The bleeding vessels on this smooth surface can be grasped with clamps and ligated. If one separates the liver tissue bluntly then the vessels, after the extreme stretching, tear and retract; they can then be grasped only with difficulty and uncertainty. In case of the smooth incision, however, they can be easily found. The liver wound should, if possible, be made in the form of a wedge and closed by means of sutures.

2. The second method of procedure consists in the application of ligatures en masse as suggested by Kasnetzoff and Penski. One does not need however a particular guiding suture or special instruments but can get along just as well with the Deshamps needle. The ligatures should be slowly but firmly tied.

In suitable cases one can make use temporarily of an elastic ligature. In the great majority of cases one can close the peritoneal cavity without any tamponade. Liver resection is often facilitated by cutting through the ligaments of that organ. In all cases where portions of the dome of the liver, which are accessible only with difficulty, are to be operated upon, it is recommended not to hesitate to resect the border of the ribs on the right side and the ligamentum suspensorium.

The transpleural method should be abandoned in all intraperitoneal affections. In cases of liver injuries, subphrenic abscess, etc., the resection of the free border of the ribs should be substituted in its place.

WULLSTEIN (Halle A. S.) had also during the past year made a long series of experiments on the cadaver, with the intention, by means of temporary resection of the free border of the ribs on one or both sides, to expose the surface of the liver and the stomach as well as those lymph glands lying in the region between

the stomach and diaphragm, in front of and to either side of the spinal column. W. can also substantiate the assertion of Auschütz, that the danger of opening the pleural sac from the anterior wall of the thorax is not to be feared as long as one remains in the buvean, that is below the seventh intercostal space. Nevertheless it is well to dissect away the resected ribs posteriorly from the insertion of the diaphragm close to the perichoridral tissue.

RIEDEL (Jena) had sad experiences with infection of the border of the ribs. After infection of the wound surface there occurs a progressive inflammation of the border of the ribs, whereby the cartilage becomes bathed in pus. In this respect there is a great difference between the costal cartilage and the ribs. The sub-serous excision of the gallbladder is only feasible in the uninfected cases. It is important to ligate separately and surely the art. vesicæ fellii. Not until then does the cysticus become free and can be ligated.

MALE GENITO-URINARY ORGANS.

I. Extirpation of the Prostate.

H. KUMMEL (Hamburg) emphasizes the fact that good functional results may be obtained by means of the Bottini operation, also by castration concerning which K. himself had collected numerous statistics, furthermore by means of ligation of the art. iliaca interna and resection of the vasa deferentia. Nevertheless, the results are for the most part not to be considered as permanent; and since the author considers that hypertrophy of the prostate should be recognized as an independent local condition in itself, as a tumor, which, like all tumors, must be removed, he therefore considers the intra-capsular prostatectomy as the best therapeutic procedure in these cases; the one which, even though it is the most heroic, guarantees the best results. He, of course, recommends even more emphatically the complete removal of the prostate in carcinoma of that organ. For the diagnosis, he recommends, in all cases, in addition to the usual methods of examination, the use of the cystoscope, which gives an exact insight into the gross anatomical picture.

As contraindications to the operation should be mentioned: marked disturbance in the general condition of the patient, marked

arterio-sclerosis, chronic use of the catheter, diffuse bronchitis, complete loss of vesical contractility, and a renal insufficiency which does not respond to treatment. With regard to the latter, he recommends under all conditions cryoscopy of the blood, a method which had never failed him when properly carried out.

Concerning the two usual methods of operation, the perineal and the suprapubic, both of which show the same rate of mortality, K. prefers the latter method, since it guarantees a better view of the operative field, an easier removal of any complications which may develop and the easier prevention of any fistula formation. Technically also, it presents fewer difficulties. K. sees, in the supra-pubic operation, an important disadvantage in the fact that the patient cannot be allowed to get out of bed so early. Nevertheless, he recommends the perineal route in all cases where the enlargement of the organ is for the main part toward the rectum and where an operation is necessary in very stout individuals.

Among 41 prostatectomies which he had performed, the diagnosis of carcinoma was made in 9 cases. Of these 3 died shortly after the operation, (apoplexy, cardiac weakness, carcinoma of the intestine with metastasis) 2 after three and four months respectively. The remaining patients were living at the end of a year and could urinate spontaneously without any complaints. In the 32 cases of hypertrophy of the prostate, the perineal route was chosen in 11 and the supra-pubic in the remaining cases. Eight of these patients, whose ages ranged from 63 to 90 years died soon after the operation and three later from intercurrent diseases. A rectal fistula developed in one case as a result of the operation. This patient died of bronchitis and cardiac weakness some time after a secondary operation for closure of the fistula. A second patient complained of disturbance in the sexual functions, a third, of painful priapism. In all of the remaining cases the results of the operation were most satisfactory, the bladder functions were entirely normal and the urine could be passed in a stream. The capacity of the bladder was such, that the patients had to urinate only every 3 to 6 hours in the daytime and at night only once or perhaps not at all. Three patients complained that they could not urinate as well as shortly after the operation. It developed in these cases that strictures were present in the pars membranacea after the removal

of which the symptoms disappeared. K. considers it, therefore, most important to pass sounds after some time (after about one half year) on all operated cases, in order to prevent stricture formation.

He had, for some time, performed the operation under spinal anæsthesia using tropo-kokain and adrenalin. He had formerly used the scopotamine—morphine—æther narcosis. In the use of the lumbar anæsthesia K. sees a distinct advance in the performance of prostatectomy, which is not to be underestimated, especially since general anæsthesia has to be dispensed with in many elderly patients, on account of the heart and lungs. K. makes the following resumé of his views concerning extirpation of the prostate.

1. In the cases of chronic, complete, and incomplete retention of urine, the permanent catheter is first to be tried, if there are no complications and catheterization can be easily performed. If this treatment is not successful and the patient is still compelled to empty the bladder by means of the catheter, then the operation is to be recommended.

2. The extirpation of the prostate is the most heroic method of operation and accompanied with the most dangers. Still with a favorable course, it promises a sure and permanent result.

3. In the choice of the mode of operation, perineal or supra-pubic, one must be guided by the individual case. Where the hypertrophied organ projects deeply toward the rectum and but slightly toward the bladder, as well as in patients where the abdominal walls are well developed and fat, one should choose the perineal route. If the prostate projects more toward the bladder, than the trans-vesical method in general, one should give the preference to the supra-pubic method since the technic is easier, the length of time of healing shorter, the after-treatment simpler, and the danger of incontinence and fistula-formation is less.

4. The actual danger of the operation appears to be about the same in either method.

5. The contraindications to prostatectomy are: marked disturbance in the general condition of the patient, extensive arteriosclerosis and diffuse bronchitis, renal insufficiency, which does not respond to treatment, and complete loss of vesical contractility.

6. Radical operation is always indicated if carcinoma is suspected.

SCHLESINGER (Berlin) reported the results at the Jewish Krankenhaws (Prof. Israel), nineteen prostatectomies—operative mortality=3 (one case from pulmonary embolism a second from coma diabeticum, the third from a post-operative anuria, cause not determined). One death five months after operation from pyelitis. Subsequent course not followed in two cases. One incomplete result in a case of partial prostatectomy. Perfect result in 12 cases. Author recommends caution in the indication for operation on account of the relatively high mortality, though cause of death cannot be ascribed to imperfection in technic.

Almost all operations under lumbar anæsthesia.

Supra-pubic method preferred:

1. Because it is more easily and quickly performed.
2. Because the median lobe can often only with difficulty be removed by the perineal route.
3. Calculi may be easily overlooked in the perineal operation.

Care of the wound:

1. Bladder completely sutured (danger of post-operation hemorrhage almost nil).
2. Tamponade of cavity left by removal of gland. Catheter in urethra (usual method).
3. Drainage from above and counter opening (only in cases of severe infection).

Fact that incontinence does not result post-operationem is ascribed, by Schlesinger, to the vicarious assumption of this function by the sphincter externus.

VOELCKER (Heidelberg). The experiences at the surgical clinic at Heidelberg comprise 32 cases of perineal prostatectomy during the past six years. The results are as follows: three patients died directly after the operation: one of collapse after chloroform narcosis; the now generally accepted lumbar anæsthesia appears to be less dangerous. A second patient died as the result of an injury to the rectum, with ascending infection of the urinary apparatus. Injury to the rectum occurs generally at the point where the pars. membranacea urethræ is bound by muscular bundles to the rectum, and where sharp dissection with the knife is necessary to separate these structures. At this point

it is necessary to use great caution and to control the procedure by means of a finger in the rectum. A third patient died of a diffuse purulent peritonitis. Although at the autopsy one could not make out any injury to the peritoneum, it was probable that the peritoneal prolongations over the seminal vesicles had been opened, an accident which can probably be prevented by a more exact attention to the anatomical details.

Two of the patients died after their discharge from the hospital; one from infection of the urinary apparatus; he had a cloaca as a result of injury to the rectum; a second committed suicide at home, 31 days after the operation. This act was probably induced as the result of a confused mental condition of the patient due to uræmia, or was due perhaps to doubt on his part, on account of an incomplete recovery from his painful disease.

With regard to the danger of the operation, may be mentioned the fact that these patients are often very critically ill for the first few days after the operation. Three patients especially were very critically ill, but eventually recovered. The careful supervision of an efficient perineal drainage of the bladder is very important in the prevention of urinary retention and septic infection.

In one case we attained a permanent poor result. The patient operated upon six years before, had suffered continuously from a chronic purulent cystitis, recurring attacks of epididymitis, and from para-vesical and peri-ureteral abscesses. In this case the prostate was removed as a whole with its capsule by the perineal method, and during the course of healing there was formed only an irregular urethra in the scar tissue. It was impossible, in this case, to perform the intracapsular enucleation of the gland.

In 5 cases the patients were left with moderate complaints, two suffered from perineal fistulæ. Concerning the technic of the operation may be mentioned the fact that the smaller the incision in the pars memb-urethræ, the less is the liability to fistula formation. It is better if one opens the urethra only in the pars prostatica. Two patients were left with a permanent weakness of the sphincter, although this condition was present, to be sure, before the operation; one patient suffered from chronic cystitis.

On the other hand, we have attained satisfactory permanent results in 21 (65 per cent.) perineal prostatectomies.

Our experiences concerning the supra-pubic prostatectomy are fewer, since we have used this method in only 7 cases. The operation from above is undoubtedly more quickly performed, completed in many cases, in fact, with remarkable rapidity. Good drainage through the bladder wound above as well as through the urethra is important during the after-treatment. The danger of pneumonia seems to be greater after the supra-pubic operation. The perineal operation, though technically more difficult, is anatomically more correct, and, all things being equal, seems to be less dangerous if performed well.

GÖBELL (Kiel) reports the results which have been obtained with prostatectomy at the surgical clinic of Prof. Helferich. The hypertrophied gland was removed six times by the perineal and fourteen times by the supra-pubic method. Only one patient died immediately after the operation, a case operated supra-pubically. The supra-pubic prostatectomy according to the method of McGill-Freyer is preferred, as being a procedure which the patients bear, for the most part, well, if used in combination with the Bier method of spinal anæsthesia. Fistulæ resulting from the perineal method remained open much longer than after the supra-pubic operation. In two instances it was necessary to close perineal fistulæ by means of plastic operation. Subsequent treatment after the supra-pubic operation must be very careful. Frequent bladder irrigations through the catheter and two drains introduced through the wound in the bladder. It is to be recommended during these bladder irrigations, to massage, every now and then, from the rectum, the space left by the removal of the prostate gland. Also for the patients to sit up early and take deep breathing exercises.

Prostatectomy was performed three times on account of malignant tumors. Exitus in all cases from pyelonephritis.

REERINK (Freiburg). In many cases it is sufficient to open the urethra and remove only smaller portions of the prostate. The urethra does not only have to be opened but must be separated as much as possible in the membranous portion. The patients can get up soon after these procedures.

P. ROSENSTEIN (Berlin) reports a perineal prostatectomy with favorable result in a 76 year old apoplectic (operation under

lumbar anæsthesia 0.075 Tropakokain) a case which seemed to him worthy of note on account of a complication with calculi. A retention of urine developed three weeks after the operation, caused by the formation throughout the entire extent of the urethra of a column of calculous material (descended from the kidneys), which had to be removed with the forceps. The perineal scar withstood well the enormous distension of the bladder due to this urinary retention. Subsequent course normal.

RYDYGIER (Lemberg) recommends early operation before catheterization fails. Supra-pubic operation preferred in enlargement of the median lobe, otherwise perineal method. R. performs the intracapsular prostatectomy leaving attached to the urethra two strips of the gland about 1 cm. thick. The urethra itself is not opened and all the rest of the prostate is removed. The technic is to be sure, more difficult, but, if the operation succeeds it is much less dangerous. R. demonstrated his method by means of photographs. Perineal incision in the median line (only exceptionally according to the method of Zuckerhandel). One then bores in with the finger in an anterior direction alongside of the M. levator ani, isolates the M. recto-urethralis and divides the same. The posterior surface of the prostate is thus exposed. The capsule is now incised on one side, the prostate separated by means of the finger and rotated until one can reach the portions of the gland lying in front of the urethra. The prostate is finally excised smoothly along the urethra and it is possible in many cases to operate without injury to the same. Incontinence of urine and fistulæ cannot develop under these conditions. Hemorrhage is less in the perineal method.

DE QUERVAIN (Chaux-de-fonds) considers the supra-pubic prostatectomy as the less dangerous, based upon the results of 12 cases. The hemorrhage is generally slight. Only two fatal cases in the 12. It is important to irrigate the permanent catheter after a few hours with sterile saline solution. All healed cases can urinate spontaneously and also retain the urine.

RUMPEL (Berlin) reports the results at Von Bergmann's clinic. Preliminary cystoscopy is important to determine the mode of operation. Many prostates which surround the urethra in the form of a solid wall, cannot possibly be operated upon according to the supra-pubic method. Author warns against filling the bladder with air on account of the danger of embolism.

In the after treatment he uses the double drainage. Bladder irrigations to be given at least 5-6 times daily. The fistulae close quickly. Psychological disturbances after prostatectomy are not rare, severe melancholia developing in numerous cases. Author had two cases of suicide.

FREUDENBERG (Berlin) presents two preparations from cases of supra-pubic prostatectomy. In both cases he had performed complete enucleation of the gland, urethra generally included. In one of these cases it seemed by rectal examination as though gland tissue had developed again, and there had taken place a prostate regeneration. This regeneration generally proceeds from the capsule. These patients retained their potency, although a preliminary vasectomy had been performed. F. had one death in seven prostatectomies. As a general rule the urethra may be disregarded, which simplifies the wound conditions and makes the performance of the operation easier and quicker. Author does not recommend elevated-trunk position.

PREINDEL (Troppan) reported two cases, in one of which there was present a balm-like occlusion of the urethra due to one of the lateral lobes. In both of these cases the potentia coeundi was retained. P. lost one man from a urinary retention at the end of a year after a successful Bottini operation.

ISRAEL (Berlin) thinks the indications for prostatectomy should be as narrow as possible. In a large material he had performed the operation only 19 times. The fact that a patient is compelled to use the catheter, is not considered an indication. On the other hand he does not consider a flabby inactive bladder as a contraindication. He had only unfavorable results after castration. The sectio supra-pubica is to be recommended on account of the ease of performance and the impossibility of injury to the neighboring organs. These injuries after the perineal operation are sometimes very great, and author considers that every prostate can be removed through the supra-pubic route. One can generally operate through a small incision and must depend rather upon the sense of feeling than upon the sight. One need enlarge the incision only if there is danger of tearing the bladder, as when large prostatic tumors are to be removed. The presence of much adipose tissue does not contraindicate the sectio-alta, rather the contrary. There is nothing to prevent the addition of a transverse incision to the original one if necessary. The

prostatic cavity should always be kept tamponed to prevent the possibility of late secondary hemorrhage, which can never be predicted.

PAYR (Graz) had operated in two cases under local anæsthesia. Fifteen minutes before the operation, he injected 50 c.c. of a 1 per cent. eucaïne solution into the bladder and then operated under Schleich anæsthesia. The enucleation is made easier by infiltrating the deeper tissues with the Schleich solution. He had never seen any bad results from filling the bladder with air.

SCHATHEIS (Wildungen) had performed *sectio-alta* in 9 cases. Among these were two deaths on the seventh day post-operationem. There was present here a *prostata circumvallata* about the urethra. Another case died on the twenty-first day. In two cases, the result was nil, while in another there was left behind an abdominal fistula. S. does not hesitate to enucleate the gland in toto. The apparently flabby bladder is no contra-indication to the operation. One should not forget the possible occurrence of impotency. Referring to a case in which the ureters united in the hypertrophied prostate S. lays weight upon the importance of making visible the ureters before the enucleation and to this end recommends the previous subcutaneous injection of either methylene blue or indigo-carminé.

HELFERICH (Kiel) is an advocate of the supra-pubic operation. The difficult cases are those where hard tumors are present. He recommends that the operator pass his own finger into the rectum in order to press the gland forward, rather than leave this to an assistant. He had operated in a similar method as Wallstein with partial resection of the symphysis.

TH. ROVSING (Kopenhagen). My views concerning prostatectomy for hypertrophia *prostatæ* are entirely different from those surgeons who treat all cases of prostate hypertrophy, or at least those complicated with chronic urinary retention (Kummel), by means of the prostatectomia totalis. I prefer to treat these elderly patients in a much more conservative manner, and it is only when I am absolutely compelled to, that I suggest to these generally very weakened old men such a dangerous operation as a prostatectomy.

Among my 150 operations for prostatic hypertrophy, are about 90 vasectomies without a death, and with 60 per cent. cures.

I agree with Helferich, that the vasectomy is a most excellent operation if it is performed early and in suitable cases; (that is to say, cases of diffuse soft hypertrophy). There was also not a death among 50 supra-pubic cystotomies. In only 10 cases have I undertaken a partial and in 6 cases a complete prostatectomy, being compelled to on account of suspected malignancy, threatening hemorrhages, or a form and size of the intravesical prostatic tumor which made the application of a Pezzer catheter impossible.

Prostate hypertrophy is in itself a perfectly benign disease, and as a matter of fact in only 16 per cent. of the cases, where a urinary retention is the result, can it be considered a disease, demanding operative interference, and the treatment should have as its object the removal of the urinary retention and its consequent dangers. If this end may be attained in the great majority of cases by such relatively harmless methods as vasectomy or cystotomy, then I consider the dangerous and indeed often unsuccessful prostatectomy as the chosen mode of procedure, to be both illogical and unjustifiable, and I should like also to ask why we should remove such an important organ as though it were a malignant tumor, when the real indication is only to provide exit for the urine.

The results of prostatectomy which have to-day been brought out, have confirmed me more than ever in the opinion that my standpoint is correct. For, firstly, it has been shown that the operation is very dangerous to life, all of the statistics showing an immediate post-operation mortality of over 10 per cent.—some over 20 per cent. and even up to 30 per cent. We could perhaps content ourselves with this result if it were true, as many of the adherents of the operation claim, that the surviving patients declare themselves entirely contented with the result of the operation. Still I should like to call your attention to the enormous number of patients who are compelled to suffer from a vesico-rectal fistula as a lasting remembrance of their operation, to the many cases of incontinentia urinæ, of perineal fistulæ, further to those cases where the urinary retention continued, entirely uninfluenced by the operation, all of which are cases which prove that the results of prostatectomy are always very uncertain. Finally among the so-called "successful prostatectomies" we find a large number of suicides, a fact which should also give us material for earnest consideration. Rumpel asks if anyone might think of the

possible connection between prostatectomy and suicide. In this connection I should like to call attention to the fact, that for many years I have warned concerning this danger of prostatectomy, demonstrating the often incurable psychic depression, which may be caused by inflammatory destruction of the prostate due to prostatitis gonorrhoeica, tuberculosa et phlegmonosa. I am firmly convinced that there is a very intimate relation here between these cases of suicide and the prostatectomy.

If I am compelled to undertake the operation I prefer the Freyer supra-pubic method. Technically this operation is so wonderfully easy and rapid of performance that I readily understand and in this respect share the enthusiasm of the gentlemen, who have resorted to it, but the operation is just as dangerous as it is beautiful and seductive. Of four cases of prostatectomy operated according to the Freyer method, one died on the second day of cardiac asthenia, a second developed on the fourteenth day post-operationem, after the external wound was practically healed, a profuse hemorrhage from the prostatectomy wound, and death was only averted through a firm tamponade after the method of Miculicz. In two cases there developed narrow strictures which demanded the constant use of bougies, and in one case the urinary retention was in no way influenced. Of two cases of perineal prostatectomy one died on the third day and the other developed a calculous deposition in the prostatic cavity with urethral strictures.

I should like to win, if possible, all surgeons to the following compromise: in complete urinary retention to limit one's self in all cases to the cystotomia supra-pubica, with no anæsthetic; this operation is entirely without danger and relieves for the time being the urinary retention and all its consequent dangers.

Following my method of suturing immediately, the wound in the bladder firmly and closely about a Pezzer catheter, any escape of urine after the operation is absolutely impossible and the uneventful healing of the wound is thereby insured. A cystitis can be cured quickly by means of nitrate of silver treatment and the renal functions, which are always impaired and insufficient in these advanced cases, can be quickly improved, thereby also the patient's general condition. When now the patient has again regained his strength, it is time enough to discuss with him, whether he is so inconvenienced by his fistula that he would care

to undergo a prostatectomy with all its dangers and uncertain results. As a rule, the patients would declare themselves perfectly satisfied and wish to retain their prostate glands. In those individual cases, however, where the prostate has developed so far forward into the bladder, that there remains no place for a catheter, and where hemorrhages and tenesmus make life unbearable, then the Freyer prostatectomy can be performed through the bluntly dilated supra-pubic fistula under much better conditions, and as a rule without anæsthesia.

II. Modifications of the Sectio Alta.

DR. WULLSTEIN (Halle A. S.). Sectio Alta is indicated especially in diseases of the prostate, in vesico-vaginal, or rectovesical fistula, and in tumors of the bladder which are situated either in the fundus or in the neighborhood of the ureters.

In this temporary total resection of the symphysis, W. makes a skin incision from a point one finger's breadth above the centre of Poupart's lig. on the right side, in a curved direction, convex downward, close to the root of the penis, which is drawn strongly downward, to a corresponding point on the opposite side. Thereupon the ligamentum suspensorium is incised close to the root of the penis, the inguinal canals opened by incisions in the aponeurosis of the *M. obliquus externus* in both sides, the vasa deferentia displaced laterally. Openings are now made in the fascia transversa just above the tubercula pubica near the outer border of the recti muscles and the anterior wall of the bladder pushed back from the symphysis by means of a finger introduced through the above openings. A gigli saw is then introduced through one of the above openings, passed posteriorly closely about the symphysis, and the latter sawed through in a line beginning below at a point in the arcus pubis just lateral to the root of the penis, and passing above through the spine of the os pubis. The same is done on the opposite side and a "double pubotomy" thus performed. By means of a chisel blow the arcus pubis is now separated transversely from the remaining portion of the symphysis, and left intact below as a narrow "bracelet of bone" with the attached ligamentum arcuatum inferius and the root of the penis. The symphysis is thus totally resected and retracted upward.

This method of resection of the symphysis, fulfills all the requirements for the subsequent operation on the bladder, and takes into consideration also all the anatomical conditions present, which might possibly suffer as a result of another mode of procedure. Since the horizontal rami remain completely intact, any lesion of the vasa cruralia and obturatoria and of the nervus obturatorius, is out of the question. Furthermore, since the median portion of the obturator foramen remains surrounded by a bridge of bone, the tension of the memb. obturatoria does not suffer injury and any predisposition to hernia-formation is prevented. And, thirdly, in spite of the fact, that the arcus pubis is separated laterally in its continuity from the rest of the pelvis, it still remains as a rim of bone, in intimate contact with the root of the penis and lig. arcuatum and the vessels and nerve to the dorsum of the penis, and the plexus of santorini are thus most carefully preserved. The erectile mechanism of this organ is thus in no way impaired.

When the operation has advanced to this point the bladder, completely emptied of urine to prevent infection, is filled very slowly and carefully with air, by means of a Nelaton catheter and a syringe. In order to prevent with certainty the occurrence of air embolism, the capacity of the bladder is accurately determined the day before by filling it with boric acid solution. Since the entire anterior wall of the bladder is exposed, the latter does not need to be filled, to the extreme, with air.

In making the incision into the bladder it is necessary to bear in mind the course of the terminal branches of the vasa vesicalia superiora et media. A horizontal or an oblique incision should be made, depending upon whether the tumor is located in the fundus of the bladder or in the neighborhood of one of the ureters.

An assistant then passes his finger into the rectum and pushes upward into the level of the wound that portion of the bladder, upon which shall be performed the extirpation of the tumor and the resection and suture. This is generally not difficult, since after further incision of the ligamentum arcuatum inferius, the root of the penis may be easily displaced anteriorly as far as necessary. It is superfluous to resect the horizontal and descending rami of the pubis further laterally from the root of the penis.

For the normal healing of the bladder wound it is desirable to keep that organ as dry as possible for two or three days. This

can be accomplished by means of permanent catheters in the ureters. It is best to use catheters with terminal openings, and they need be passed only a short distance into the ureters. It is also advantageous to inject once or twice daily into the catheters a small amount of a 1/10-1 per cent. silver nitrate solution. In addition to the ureteral catheters a Nelaton catheter should be introduced into the bladder.

That fistulae occur so often after the bladder suture (adaptation Lembert sutures) is to be explained by the anatomical conditions present. It is especially inadvisable in these bladders with thickened rigid walls to introduce a further "invagination suture," since the Lembert must thus necessarily become stretched, loosened and insufficient. In addition, the invagination suture is entirely useless, since here on this extra peritoneal portion of the bladder wall we have to do with only the prevesical fat, or if we dissect this away, only the muscle layer; in short, tissues, which, if coapted by invagination, show (in contrast to the serosa of the stomach and intestines) absolutely no tendency to a fibrinous adhesion and union. The aim here must be, therefore, to attain such healing of the wound surfaces as shall produce within two or three days a firm union over a given area by means of budding and branching of the blood vessels. Therefore in these cases with hypertrophic and rigid bladder walls, where the predisposition to fistula-formation is especially great, a curved incision should be made through only the outer half of the bladder wall, this outer layer then dissected back, either bluntly or by sharp incisions, in the form of a flap and retracted. An opening into the bladder is then made in the middle of this surface by means of a sharp straight incision. This incision in the inner layer of the bladder wall, which is soft and pliable, and therefore suitable for invagination, may be permanently closed by suturing in two or even three layers. In this method of invagination broader surfaces are brought into contact with each additional layer of sutures and the best chances for healing are afforded. Finally, the flap made from the outer layer of the bladder wall is sutured back in its original position, and adds from this protection to the invagination sutures.

The symphysis is then fixed in place by means of two silver-wire sutures on either side and the rim of the arcus pulis united to the surrounding bony structures by means of silk sutures

through the periostium. The incised lig. suspensorium is then repaired and the two slit-like openings in the fascia transversa closed. The vasa deferentia are now replaced in the inguinal canals and these closed by suturing the aponeurosis of the external oblique. There remains now only the skin incision to be closed.

III. Total Extirpation of the Urinary Bladder with Double Lumbar Ureterostomy.

T. ROVSING (Copenhagen). A total extirpation appears to be indicated in many cases of extensive diffuse malignant growths. While up to the present time only about 30 such operations have been performed, this is undoubtedly due to the high primary mortality (over 50 per cent.) of the procedure. This high mortality is not due so much to the actual danger of the extirpation, as to the difficulty in caring for the cut ends of the ureters, in such manner as to prevent the subsequent urinary infiltration and infection of the wound cavity.

The methods which have been used up to the present time in the care of the ureters, are for the main part the following three: 1. The ureters have been left lying free in the floor of the large wound cavity (Bardenheuer, Kümmel). 2. Implanted in the rectum (Maydl) or in the flexura sigmoidea (Wilms and others). 3. Implanted in the vagina which is then closed by calypocleisis.

The great mortality and the disagreeable features attendant upon the above-mentioned methods (urinary infiltration, ascending infection of the kidneys from the rectum, etc.) have induced me to seek a new path for the exit of the urine. Since the results of my three operated cases have encouraged me to continued attempts, I allow myself to present this method for your worthy consideration. Concerning first the extirpation of the bladder, I generally perform the operation without opening that organ after the manner of enucleation of a cystic tumor, proceeding as follows: The bladder is first injected with 200 c.c. of an antiseptic fluid and the patient put in the Trendelenburg position. Good access to the bladder is gained by a curved incision, convex downward, with partial separation of the insertion of the Mm. recti. The vertex and lateral portions of the bladder are now separated

from the surrounding loose connective tissue by means of double ligation and incision of the firm vascular connections; then, if possible, the peritoneal covering is separated carefully from the posterior wall of the bladder; if, however, the peritoneum is adherent to the infiltrated bladder wall, then the peritoneal cavity must be opened and the organ removed with its serous covering. The ureters are severed 1-2 cm. from the bladder, cutting between double ligatures. In female individuals it is now only necessary to separate, by blunt dissection, the neck of the bladder and about 1-2 cm. of the urethra, clamping these off with a narrow augiotrihn and severing peripherally. In male patients the process is more complicated. Here the prostate and base of the bladder must be carefully separated from the rectum. The pars memb. urethræ which is now exposed, is drawn out in the form of a pedicle, and severed after first applying a narrow hemostat peripherally. This clamp remains in place 24 hours in order to prevent hemorrhage from the cavernous tissues. It is thus possible to complete the bladder extirpation as a practically bloodless operation. If the peritoneal cavity has been opened and the serous covering removed with the bladder, it is now closed by means of a transverse a Mikalicz drain, which consists in spreading out a large piece of gauze in the wound, and filling it with strips of the same material. The whole is brought out through the centre of the wound. I always saturate the gauze strips with a 1-2 per cent. silver nitrate solution. The recti muscles are now sutured with aluminium-bronze sutures and the skin-wound closed.

After this operation, which lasts from one-half to three-quarters of an hour, short lumbar incisions are made on either side, extending laterally 8-10 cm. from the border of the M. erector spinæ. Each ureter is now sought out by palpation just below the pelvis of the kidney, and brought forward into the wound by hooking a finger about it. It is now separated cautiously by means of blunt dissection with the finger down to the ligated end and drawn up out of the wound. We now have both ureters hanging free from symmetrical points in the triangle of Petit, each about 8 cm. from the median line. The lumbar incisions are now sutured. In my first case, I immediately cut off the ureter, flush with the skin suturing the tunica fibrosa to the fascia and the mucosa to the skin. Funnel-like retractions of the ureters took place in this case and I have therefore modified my

technic in the later cases; I do not fix the ureter at all but leave it hanging down entirely free in a glass receptacle, after inserting a No. 12 rubber catheter, until its end is just past the level of the abdominal wound. Externally the ureter is drawn through a perforated rubber finger and thereby protected. The ureter now heals in the wound and the free dependent portion shrivels up and becomes necrotic to within 2-3 cm. of the wound. When the lumbar wound is healed at the end of 8-14 days, the necrotic portion is excised, while the living portion projects as a small beak-like urethra above the skin level and is soon covered externally with epidermis.

From now on the catheter is not introduced, and the free passage of urine is provided for by means of a bandage, made according to my design by the firm of Svenssen and Hagen.

The bandage consists in a broad elastic girdle, in which are sewed two silver plates each with a circular opening into which fits exactly a flat silver capsule which collects the urine. Attached to this silver capsule and passing over the border of the plate is a flattened silver tube, and from this a rubber tube, through which the urine passes to a urinal below the symphysis. On the urine side of each silver plate is a circular rubber ring filled with air, which, by means of the bandage is pressed firmly against the lumbar region about the opening of the ureter. By means of this bandage worn day and night for 11 months, my first patient was able to keep absolutely dry. R. demonstrated a bladder removed from a 34-year-old single woman. The entire mucous membrane was changed into villous masses, and the entire posterior bladder-wall was so infiltrated with the tumor masses that it had to be removed with its serous covering attached. For 6 months she had suffered from constant profuse hematuria and constantly increasing tenesmus, and upon admission to the clinic was most miserable, anæmic and had lost much flesh. Cystoscopy was impossible on account of the hematuria and tenesmus. After dilatation of the urethra *ad modum simon*, a digital exploration of the interior of the bladder was undertaken, and it was determined that the entire mucous membrane had been changed to tumor masses.

Total extirpation of the bladder with double ureterostomy performed on May 3, 1906. All three wounds healed well, but stay in bed was materially lengthened by the development of a

thrombosis in the left vena femoralis. Since then the patient has improved rapidly, gained 30 pounds, feels well, and is able to work. The bandage acted to her entire satisfaction so that she remained dry day and night.

Twice since then the author has had occasion to perform the same operation upon male patients, both in the university clinic.

The first case is that of a 67 year old man, who was operated upon September 6, 1906. He had two cancerous papillomatous masses in the bladder, one of which had invaded the entire region about the left ureter, while the other had infiltrated the vertex and collum vesicæ, in all the layers. Extirpation without hemorrhage and peritoneal cavity not opened.

As had been expected, the left ureter was markedly dilated and the left kidney, hydronephrotic, the right ureter normal, but the right kidney entirely atrophic, a condition which had not been suspected. The wound healing was normal but the patient became uræmic on the eighth day and died in coma.

Cause of death determined at autopsy to be due to double renal atrophy and myocarditis. It was interesting however to note that not the trace of a metastasis could be found, a fact which should encourage us to renew our efforts and constantly seek a radical cure for these cases of vesical and prostatic carcinoma.

The third preparation was from a 57 year old man, upon whom R. had operated four weeks previously. It was possible here to extirpate the bladder unopened in conjunction with the prostate and the pars prostatica urethræ; fortunately, for one can see from the preparation, that not only is the major portion of the bladder infiltrated with an encephaloid carcinoma, but the Pars prostatica urethræ shows already small tumor masses. This patient also withstood the operation, especially well and at the present time feels perfectly normal. His kidneys act in a satisfactory manner, so that a radical cure, in his case, depends upon whether he also is free from metastases.

The advantages which my mode of operation appear to me to possess over the former methods are the following: 1. A completely aseptic bladder extirpation is possible, since urinary infiltration and infection from feces are impossible. 2. There is thus prevented the great danger of a secondary ascending infection, which is always possible when the ureters are implanted in

the rectum *S. romanum* or vagina. 3. In female individuals this method has the advantage over the vaginal implantation of Pawlick, that the genital sphere and functions of the woman are undisturbed.

Perhaps this operation may be indicated not only in malignant tumors, but also in the severer forms of *ectopia vesicæ* and also in ascending uro-genital tuberculosis.

BOOK REVIEWS.

AMERICAN PRACTICE OF SURGERY. A Complete System of the Science and Art of Surgery. By Representative Surgeons of the United States and Canada. Editors, JOSEPH D. BRYANT, M.D., LL.D., and ALBERT H. BUCK, M.D. Complete in Eight Volumes. Profusely Illustrated. Vols. I and II. Wm. Wood and Co., New York, 1907.

There are two ways now a days of writing a medical book, single handed or in a sort of literary partnership. When a man eminent for experience in learning and in works writes a treatise on his chosen subject, he makes his volume the record of his own achievements and a measure of his own knowledge. According to his ability as a teacher and the lucidity of his style as a writer, such a work becomes valuable as a text book for medical students or a handy reference volume for the desk of the busy practitioner. The scope of such work must always be limited since the table of contents is measured by the horizon of one life. They reflect, however, far more clearly the personality of their authors and have an individuality and charm which must always be denied to the more pretentious "system" which one might call the orphan asylums of medical literature. Nevertheless, the systems with many parents have far more potential energy than the volumes which own but one paternity, where in fact the chapters are often fragmentary and suggestive rather than complete, and provide an emergency ration rather than a full meal. Medicine and Surgery at the present time have become so highly specialized that it is impossible for any one mind to master the subject or even to be fairly proficient in all its branches sufficient for the needs of the individual if he has a working knowledge of his chosen field and the means of enlightenment where the vastness of the field has left him bewildered and astray. It is just here that an eight volume treatise supplements the defects of the shorter works written by individual authors. It is their part to give the full measure of knowledge required by the earnest worker by grouping together in

a harmonious whole the differing but kindred subjects which together make up the complex fabric of modern medicine or surgery.

This it is, which is the *raison d'être* of the system with its editors, collaborators or separate authors. Each subject in a system of surgery should be exhaustively treated, but it is precisely this which requires that the work should be apportioned among different men, each author a man who has largely devoted his life to his subject and therefore best qualified to write exhaustively because of special knowledge and special opportunity. On the other hand, a work of this character, unless judiciously edited may be badly balanced, with chapters of unequal merit and learning and style so motley that while we appreciate the business acumen of the publisher, nevertheless we are compelled to sympathise with the editor. Of the present system no one to whom the senior editor is well known will venture to predict such a quality. His reputation for learning and decision forbid us to anticipate in these volumes anything save the best that the profession of this country can offer. Nor are we disappointed as we review volumes I and II now in print.

Volume one is largely devoted to the discussion of what may be termed the basic facts of surgery. The introduction is an interesting chapter by the venerable Stephen Smith on the history of American Surgery. When a man of 86 years of age, the Dean of American surgeons discourses of the history of the art in this country we can say of him what his modesty forbade him to say of himself "*Magna pars fui.*"

The chapter is largely one of personal reminiscences and therefore of twofold interest. The chapter on inflammation sets forth the modern view of what the older surgeons regarded as a disease in itself, when it defines the process as one which is adaptive, protective and reparative. In a few words this sentence states the difference between the older pathology and the new. Chapters follow on disturbances of nutrition, on certain special infections and on tumor formation. There are two points of view from which we may regard the facts of tumor formation, the purely pathological and histological and the clinical and experimental. The chapter on the histology and theory of tumor formation treats the subject from the first standpoint with almost the completeness of a special work. Cohnheim's theory is re-

spectfully spoken of as "the most brilliant hypothesis concerning the origin of tumors ever advanced." Why a hypothesis which has absolutely failed to explain the *cause* of the overgrowth should be so characterized is an enigma. A hypothesis is valuable alone in proportion as it explains and accounts for certain facts and in medicine or surgery offers us a scientific basis for therapy. In cancer it is not so much the character of the cells which concerns us as their overgrowth and the toxæmia which the disease produces irrespective of mere nutritional disturbance dependent on a disturbed function mechanically interfered with. The difficulty with the "brilliant" theory of Cohnheim and other kindred, is that they concern themselves with the character of the cells but not at all with the most vital problem of cancer, the cause of the overgrowth. No theory which loses sight of this factor in the problem deserves commendation. Such theorists have been but blind leaders of the blind. Up to the present time they have offered us no basis for rational therapy nor have they taught us how we are to live so as to avoid the disease. When we turn to the clinical and experimental method of investigation we may at least bid ourselves hope. What surgeon is there who has not met with utter defeat in his attack on this most fiendish of diseases? Who is there who has not seen his patient succumb either because the disease was inaccessible surgically or in spite of the most painstaking and radical work? We all mourn our defeats which alas outnumber our victories. We used to think the three year limit safe. Now we have been obliged to advance it. Says McCormick of England, "Call no woman cured of cancer until she is dead." Baldy states that less than 5 per cent. of cases of cancer of the cervix are cured. Yet no phase of the disease has been the subject of more persistent and careful attack. What comfort is there for us after all in Cohnheim or Ribbert? They leave us where they found us, in the mire of defeat and hopeless defeat. No surgeon, however, can read this chapter of Gaylord's without a reawakening of hope in his heart. If tumors known to be malignant can be transplanted with 100 per cent. of successes in animals this fact in itself is sufficient to remove us from the benumbing influence of purely histological theories. Gaylord may not have discovered the cause of cancer, but his work and that of others working along similar

lines has done much to rid the atmosphere of dense mists and shadowy hypothesis. If in addition it can be shown that some mice recover from the malignant mice tumors and that such mice can never again be successfully inoculated and that the sera of such mice has an inhibitory effect on the tumors of non immune mice, experimental pathology will have done much to furnish a sound basis for therapy. Let it once be established that cancer is contagious and the incidents concerning infected cages related by Gaylord seem to warrant such a supposition and we shall have advanced a long way toward the solution of the problem. As we read Gaylord's account of his work in the Buffalo Laboratory for Cancer Research we cannot but feel encouraged for the future and we confess to a feeling of admiration and sympathy for the tireless workers who pursue their quest undismayed and undisturbed despite much unfriendly and some unjust criticism. May they reach their goal! The chapter on Surgical shock will disturb many old notions as to the efficacy of remedies which all of us have used in this condition. It is to be regretted that we are not offered anything very tangible in exchange. The chapter on general surgical diagnosis is the fruit of close observation and wide clinical experience. It is a monograph which ought to be put into the hands of every medical student when he graduates.

The increasing importance of the Röntgen ray both from the diagnostic and therapeutic standpoint is emphasized by the length and excellence of the chapter devoted to its consideration. Of especial importance is the section devoted to its interpretation.

Volume two opens with a chapter on the surgery of what may be termed the tropical diseases. It also treats of anthrax, glanders and actinomycosis. Other chapters follow on the surgical disorders associated with syphilis and tuberculosis, those twin spectres which accompany poor humanity from the cradle to the grave. Other chapters treat of the surgical disorders of the skin, muscles, tendons, nerves, lymph nodes, etc. Burns produced by the electric current are dealt with in a special chapter and the volume concludes with a long and informing chapter on bullet wounds. The reader is here given the latest knowledge possessed on this subject by an expert who has been familiarized with the effects of modern high powered projectiles by actual service. Space forbids more extended discussion of individual

chapters. All are written by men who are authorities in their specialty. Much of the matter is new and all of it valuable.

The editors are to be congratulated on their work. They have chosen their collaborators wisely and have together wrought a work which is a credit to the science and art of Surgery as practiced and taught on this continent.

ALGERNON THOMAS BRISTOW.

A MANUAL AND ATLAS OF ORTHOPEDIC SURGERY. By JAMES K. YOUNG. P. Blakiston's Son and Co., Philadelphia, Pa.

This very comprehensive work exhibits the result of the extended experience of the author and also a studied presentation of the subject. The arrangement is a logical one and the text very readable. The selection of illustrations in this as well as in many other treatises of the present day is open to criticism. Although a great advance has been made by substituting artistic photographs for crude drawings, yet it would seem that too much space is sacrificed for a finished product of art without a sufficient teaching value to compensate for the increased bulk of the volume. Another frequent fault of the medical illustrator is the depiction of the extremes of deformity and disease. What the reader wants is an aid to early diagnosis—such as the author gives in some of these pictures of attitude in spinal caries. The book is profusely illustrated and the illustrations are well done, in fact the whole work is a good example of the printers art. It is well worthy of a place in the library of the general practitioner as well as the specialist.

After an opening chapter on the history of the subject, the author takes up the general etiology and pathology of deformity, with its symptoms and diagnosis, all of which are most instructive. Considerable space is then given to prophylaxis and general treatment in which is concisely stated the different methods employed for mechanical support and forcible corrections. A chapter is devoted to tenotomy with a brief outline of tendon and nerve transplantation.

The chapter on Potts disease is comprehensive with all points well illustrated. In the treatment of abscesses, however, the author hardly lays sufficient stress upon the value of the expectant or conservative side. Following the discussion of tuberculosis

of each joint, the non tuberculous affections are well covered. The subject of hip disease is also thoroughly gone into with a discussion of the various methods of treatment. Most of the chapter on non tubercular disease of the hip is devoted to coxa vara, that condition receiving fuller treatment than in any other orthopedic work except Whitman.

Lateral curvature receives the extended discussion which it demands. Not as much space, however, is given to the surgery of paralysis as the comprehensiveness of the treatise would lead one to expect, but otherwise the varied forms of paralysis are carefully explained and illustrated,

The subject of acquired valgus or weak foot receives too little attention considering the prevalence and importance of this disability—no mention being made of the Whitman arch support. Much greater space is devoted to congenital dislocation of the hip which is instructively dealt with in diagnosis and the different operations for reduction.

Although many criticisms have been made, yet this manual of orthopedics will be found of great interest and value, of help to the physician as well as the student of Orthopedics.

CHAS. DWIGHT NAPIER.

PRACTICAL GYNECOLOGY. A Comprehensive Text-book for Students and Physicians. By E. E. MONTGOMERY, M.D., LL.D. Third Revised Edition. Philadelphia: P. Blakiston's Son & Co., Publishers, 1907.

In the preface to the first edition of this work (under date of August, 1900), the writer states that the work has been under consideration for fifteen years and much of it had been rewritten several times. An effort was made "to make it a comprehensive work upon the subject, giving the experience and methods of the most careful men, while my own experience has been utilized to indicate that which I have found most useful and worthy of acceptance."

In the second edition, appearing in 1903, such changes were made as are necessary in the natural growth of the subject and, as from experience with the previous edition, the author thought would prove of benefit to the student.

The present edition represents another careful revision of

the subject, paying special attention to microscopic diagnosis, gynecic bacteriology and the pathology of uterine cancer.

One of the best features of this work is that each general subject, as far as feasible, is considered with reference to its influence upon the entire genital tract, thus giving a more comprehensive view of each subject than when each organ and its diseases are studied separately. This work has been and still is one of our best text-books and we welcome the present edition.

J. A. SAMPSON.

- I. DIE BEHANDLUNG DER TUBERKULOSEN WIRBELSAULEN-ENTZUNDUNG, VON DR. F. CALOT, uebersetz von DR. P. EWALD.
- II. DIE BEHANDLUNG DER ANGEBORENEN HUFTGELENKSVERRENKUNG, VON DR. F. CALOT, uebersetz von DR. P. EWALD. Stuttgart. Ferdinand Enke, 1907.

I. This translation has retained much of the vivid and picturesque style of the original brochure. The book deals with the treatment of the Kyphotic Spine of Potts Disease. Calot believes that merely the gibbus of small extent may be straightened. This is to be accomplished by "redressement." After describing the manner of applying a plaster jacket from the neck to the trochanters, embracing the chin and occiput when the gibbus is higher up, the method of "redressement" is detailed. A fenestra is cut out of the plaster jacket to correspond to the gibbus. Over this several pads of cotton are placed to exert a moderate pressure. At the expiration of every 14 days the pads are renewed and their number increased until the deformity is obliterated. The pads are held in place by circular turns of dextrine bandage. A feature of this "Calot jacket" is its construction out of large layers of dextrine gauze, steeped in plaster cream, which are moulded to the form. A large window is cut out of the front of the jacket. Emphasis is placed upon the necessity of extension—but not suspension—in applying the jacket. To some extent the case is passed upon as healed by the alignment of the spinous processes in the radiogram. A jacket is worn five to six months and is then renewed or a celluloid corset, moulded to the cast made from a model of a plaster jacket. Calot is very enthusiastic in his recommendations of the injection of iodoform-oil and camphor naphthol for the treat-

ment of cold abscess and sinuses in connection with spondylitis. The iodoform is preferred for the well defined abscesses, the camphor naphthol for those in a fungating condition. As many as a dozen injections are made at intervals of a week.

For the complication of paralysis Calot recommends no treatment other than a well fitting plaster jacket.

The instructions are so explicit and the illustrations so numerous and well represented that it should be an easy matter for the practitioner to acquire this technique.

II. The original of this work appeared in the French language. It was so replete and exacting in its detail, and based on a practical application in so large a number of cases (443), that it suggested itself to Dr. Vulpus that it would be very desirable to possess a German translation to supplement the German writers on Bloodless Reduction of the congenitally dislocated hipjoint, who were the pioneers in this method!

The two introductory chapters are devoted to the early diagnosis of congenital dislocation, emphasizing a scrutiny in the gait, examination in the erect and recumbent posture. Acquired forms of dislocation due to traumatism, osteomyelitis, typhoid fever, and paralysis, are differentiated by the history of their onset. The prognosis is hopeless in untreated cases. Children under 7 years of age, if properly treated, are always cured. Between the ages of 7 and 12 a cure can be effected in 90 per cent. of the cases, wherefore reposition is always to be attempted. In children between the ages of 12-15 reposition is possible in three out of every four cases. Beyond the age of 15, reposition is difficult and possible occasionally if preceded by a long period of extension. In bilateral dislocations the age limits of reposition have to be lowered by two to three years. Emphasis is placed upon proper "Reposition." If the latter has been effectively done, we have at the present day means at our disposal to maintain the reposition.

The remainder of the book is divided into two parts. Part one is given to a consideration of the technic of reposition embracing the manœuvres, the application of the plaster of Paris bandages, and the after treatment. It is possible if one is very accomplished in the technic, and certain of reposition to effect a cure with a simple application of a plaster of Paris bandage. A better control of the position is possible by a reapplication at the

end of two months and for similar reasons a third-bandage is to be applied.

The after treatment embraces correcture of the thigh, the position of the kneejoint and the lordosis. Active motions alone are to be relied on to restore mobility of the hip. The muscles to be strengthened by massage.

If a relaxation is encountered anteriorly, a new reposition with flexion of 60° and 30° – 50° abduction is recommended; for posterior relaxations an abduction of 90° is necessary.

The second part of the book is devoted to a consideration of the various chemical forms of the unilateral and bilateral dislocation.

In speaking of the results in the 15th chapter, author claims 100 per cent. cures in the last 100 cases. In children beyond 10 years of age who are treated a rigidity of the joint may result and even where transposition follows reduction a better functional result is obtained. Severe relaxations are not to be encountered if the technic of forced abduction and hyperextension advocated by Germans is abandoned. Without fear of exaggeration in the early-treated cases, one can speak of a "radical cure" as does the surgeon in the radical cure of hernia.

The significance of radiogrammes is thus stated. The Röntgen rays have contributed to the development of the technic, so that we can now apply the technic without having refuge to the X-rays at all times in the average case.

The concluding chapter covers the operative treatment of cases not amenable to reposition. Hoffa's operation is passed upon as being a formidable procedure with but moderate success at the best. Senger's operation is regarded as less severe, but the reposition is incomplete. Calot characterizes his open operation of small incision and dilatation of the capsule with subsequent reposition of the head as being on a par with tenotomy in all other respects like the bloodless reduction.

The concluding chapter embodies the palliative treatment of irreducible dislocations. Either with the aid of orthopedic appliances or by successive application of plaster of Paris spicas the gradual correction in whole or in part is effected.

The aforesaid is an epitome of the narrative embodied in the 271 pages of this book. It has been the author's aim to outline the treatment with all the precision it requires, so as to

be available for the practicing physician. In this respect, the work is far too comprehensive. The 206 illustrations afford a most graphic presentation of every manipulation, and the radiographs are of the best. A translation in the English language of this practical monograph is devoutly to be wished.

MARTIN W. WARE.

GYNECOLOGY AND ABDOMINAL SURGERY. Edited by HOWARD A. KELLY, M.D., Professor of Gynecologic Surgery at Johns Hopkins University; and CHARLES P. NOBLE, M.D., Clinical Professor of Gynecology at the Woman's Medical College, Philadelphia. Large octavo; 851 pages. Philadelphia and London. W. B. Saunders Company. 1907.

Volume I of this treatise is a marked addition to the literature of its subject. While it shows forcibly the intimate relationship between gynecology and abdominal surgery, it tends to demonstrate still more forcibly that gynecology is simply a branch of general surgery and should always be considered as such. The editors in their preface call the general surgeons their "competitors, and generous critics," and say that "they (the general surgeons) will not deny that the great advances made in the gynecologic field have constituted the very backbone and the marrow of the abdominal surgery of to-day." No doubt those who have at first devoted themselves exclusively to operations upon the uterus and adnexa will view the field from this standpoint, but, as in the present case, it is often these very men themselves who have seen the narrowness of their field and have rapidly reached out, claiming the bladder, the rectum, the ureters, the kidneys, the appendix, and even the diseased breast, as within the field of gynecology.

In one of the greatest and most brilliant books of recent date upon the subject of Operative Gynecology, there appears a chapter on the Radical Cure of Hernia and a chapter on Intestinal Suture. Is this not abdominal surgery? It is evident that the surgeon must first become proficient in general surgery before he devotes himself to gynecology. Gynecology has become what it is to-day because general surgeons have entered on its domain.

The present work is edited by Howard A. Kelly of Baltimore and Charles P. Noble of Philadelphia. The various chap-

ters are written entirely by American authors. Three of the collaborators, Drs. Alexander J. C. Skene, Wm. R. Pryor, and Ferdinand Henrotin, have died during the preparation of the work.

The first volume is devoted strictly to gynecological subjects. There are many interesting features. The chapters on the bacteriology and pathology of gynecology by William Ford and Elizabeth Hurdon are the most extensive that have yet appeared on the subject. There is a chapter devoted entirely to medical gynecology which is a fitting compliment to the surgical considerations. The remainder of the book takes up in detail gynecologic technique and gynecologic operations. In a number of instances where differences of opinions concerning the relative advantages of the abdominal and of the vaginal route for the performance of operations have existed, advocates of each side have been chosen to write upon the subject.

The book is most elaborately illustrated, every illustration having been specially made either by Hermann Becker or Max Brödel, whose work has yet to find their equal. They are anatomically accurate and beautifully executed.

PAUL M. PILCHER.

CORRESPONDENCE.

SUBSEQUENT REPORT ON A CASE OF SEVERE SPINAL CORD INJURY, SYMPTOMS OF COMPLETE SEVERANCE OF THE CORD.

EDITOR ANNALS OF SURGERY:

In the November, 1906, number of the ANNALS, I reported a case of dislocation of vertebræ in the lower cervical region, followed by symptoms of complete severance of the spinal cord. The operation of laminectomy was performed by Dr. Roswell Park of Buffalo, fifteen days after receipt of injury, and at the level of the 6th cervical segment the cord was found to be flattened so that it did not nearly fill the canal. There was a small remnant of an old clot within the dura. On lifting the cord with an artery needle, it seemed flattened, ribbon-like, shrunken, and to lack in bulk. The patient made a slow, continuous improvement, able to move the feet a little, and considerable improvement in sensation; in the hands and arms not much change appeared. He left the hospital about four weeks after the operation. Considerable later improvement is evidenced by the following letter received on August 8, 1907.

WELLSVILLE, N. Y., Aug. 6th, 1907.

DEAR DR. KRAUSS:

I thought I would write you a few lines and let you know that I am working again at my old trade (operator). I am back in the office and can do the work all right now, does not tire me hardly any, and am feeling fine.

I seem to be gaining right along, but of course it is very slow. Cannot get around alone, but can get around the house with help of some one, just enough help to steady me. Cannot hold balance well enough to go alone, but have walked ten or fifteen feet alone by using cane.

The continued improvement in the case is sufficient evidence to prove the advisability and necessity of operation in cases of spinal cord injury, even if the reflexes are totally absent, the bladder and rectal sphincters paralyzed, complete loss of motion and sensation, and even with a moderate degree of cystitis and beginning bed sores present.

WILLIAM C. KRAUSS, M.D.,
Buffalo, N. Y.

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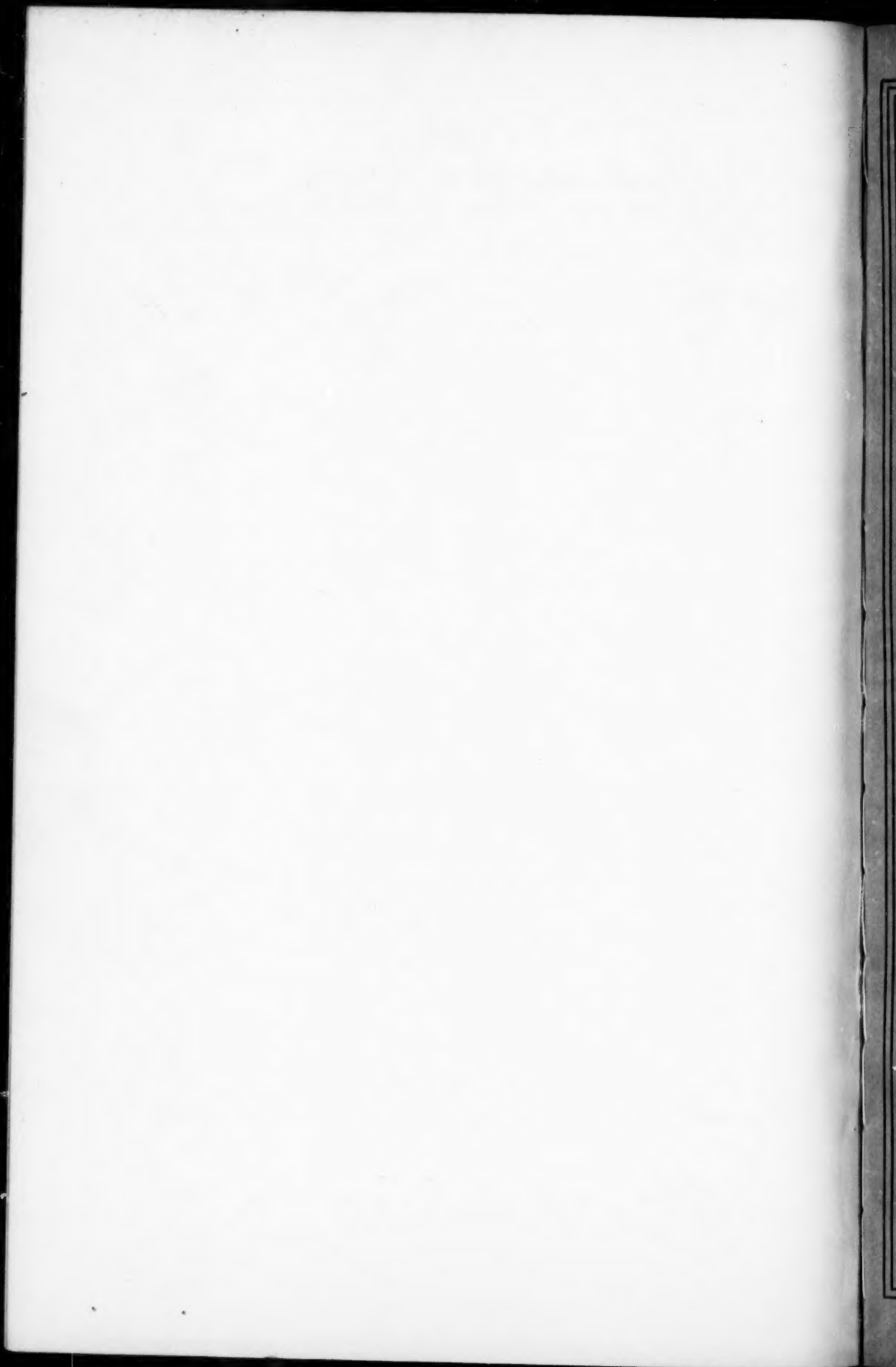
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ANNALS OF SURGERY

A Monthly Review of Surgical Science and Practice.

Edited by LEWIS STEPHEN PILCHER, M.D., LL.D., of New York.

WITH THE COLLABORATION OF

J. WILLIAM WHITE, M.D., LL.D.,
OF PHILADELPHIA.

SIR WILLIAM MACEWEN, M.D., LL.D.,
OF GLASGOW.

W. WATSON CHEYNE, C.B., F.R.S.,
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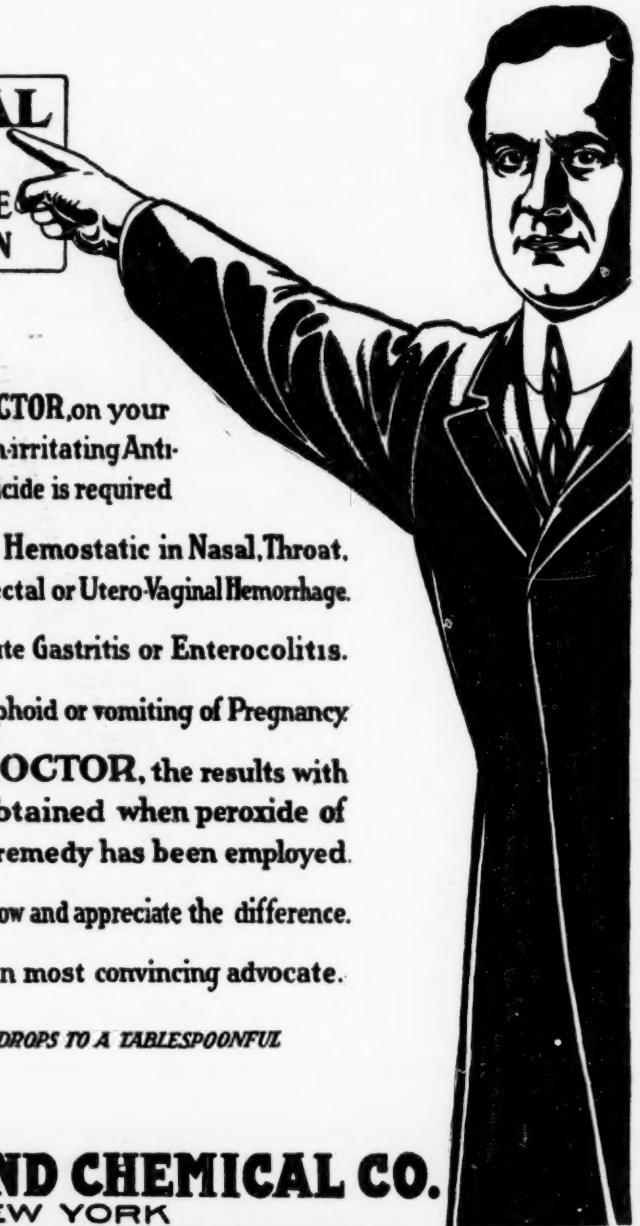
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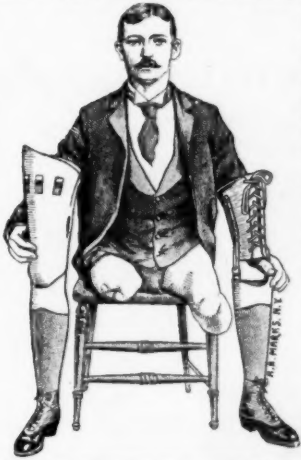
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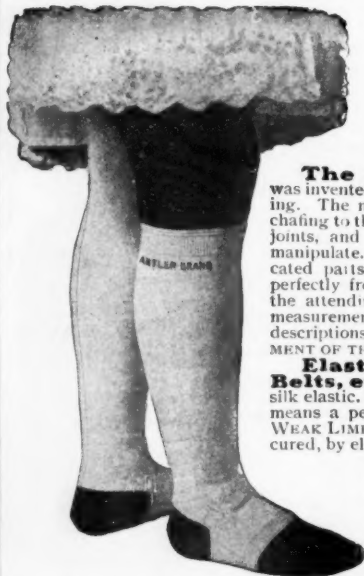
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THE SERUM TREATMENT OF EXOPHTHALMIC GOITRE.

Harriet C. B. Alexander (in *The American Practitioner and News*, August, 1907) discusses the subject and reports thirteen cases. Four principal theories of the disease have been advanced: (1) That it is due to disease of the sympathetic nervous system; (2) that the seat of the malady is the medulla oblongata; (3) that it is primarily a disease of the thyroid gland; and (4) that it is a neurosis.

Modern therapeutic measures have been largely based on the "thyroid" theory. The results of partial strumectomy indicate that the successful removal of a portion of the thyroid gland can lead to cure or to definite amelioration of the condition. On the theory that the thyroid secretion normally neutralizes certain general metabolic poisons in the body, Moebius and others conceived of treating cases of exophthalmic goitre, in which there is presumably an excess of thyroid secretion in the body, by introducing subcutaneously, or by the mouth, the serum of thyroidectomized animals. It was hoped that the non-neutralized general metabolic poisons of such animals would nullify the toxic effect of the excessive thyroid secretion. As to the treatment, experience has shown the great importance of general measures: complete rest for a time, fresh air, careful diet, mild balneotherapy, etc.

The name Thyroidectin has been given to a preparation obtained under aseptic precautions from the blood of animals from which the thyroid glands have been removed, and which is exhibited as a reddish-brown powder contained in capsules, usually five grains each. Carefully conducted clinical trials seem to show that Thyroidectin can be depended upon to control the characteristic symptoms of exophthalmic goitre. In most cases the patient experiences much relief from the restlessness, tremors, insomnia, and other nervous symptoms so frequently present, and a gradual lessening of the frequency of the pulse rate, decrease in the size of the glands, and a diminution of the exophthalmos, with an increase of weight and a much better condition generally. The dose of Thyroidectin seems to be one or more capsules after each meal; according to the judgment of the physician and the reaction of the patient.

In nine of the author's thirteen cases the size of the gland was materially reduced,

and in every case improvement was observed with respect to one or more of the symptoms.

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The victim of the dentist held up his hand. "Doctor," said he, "before you put the lid on my conversation, will you answer a question?"

"Yes," said the dentist, selecting a square piece of rubber and snipping it with his scissors.

"Do people chew more on one side of the mouth than the other?"

"Sure," said the dentist, picking up the clamps.

"How interesting! Which side?"

"The inside," replied the dentist, slipping the rubber dam over the verbal one that issued from his patient's lips.

—December Lippincott's.

SPEAKER CANNON EXPLAINS.

"Uncle Joe" Cannon and a friend were one day discussing the wild doings of a young Chicago man with whom both were well acquainted.

Mr. Cannon's friend was inclined to be very severe in criticism of the sower of wild oats; but "Uncle Joe" had more to say of his good than his bad qualities, remarking that at heart the boy was "all right." He thought it would be well to reserve judgment and give the lad a chance until he reached the age of discretion.

"At just what period would you place the attainment of discretion?" asked the friend quickly.

"Generally speaking," added "Uncle Joe," "I should say that a young fellow has reached the age of discretion when he removes from his walls the pictures of actresses and substitutes therefor a portrait of his wealthy bachelor uncle." —December Lippincott's.

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The surgical patient that is burdened with a retention of the toxic products of metabolism is in poor condition, indeed, for an operation. The customary cathartic is not calculated to do more than empty the bowel, and it should be more generally appreciated that the blood is best depurated through the kidneys. A good renal eliminant like Alkalithia is often an ideal preparatory treatment, especially in the well-to-do, and should be more often used before operating, where time permits.



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Therapeutics of Infancy and Childhood 3d ed. p. 127.

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Are the nurses you engage all that you would have them be? Are you perfectly satisfied with their work and ability? Perhaps so, but you would desire that they continue always to be that way, would you not? In fact, progress as you do, is it not so? You learn from your journals the latest methods in modern medicine, the advances being made here and there, but what about your nurse? It is just as essential that she too advance with the times, or the first you know there will be an urgent need of a more competent bedside assistant. In this connection we cannot recommend too highly the *American Journal of Nursing*. There are journals, and journals, and JOURNALS, for a nurse, but this is a *real* journal. It is fearless yet conservative, progressive yet stable, and withal advocates nothing but what is of real benefit to both the nurse and the doctor.

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THE ONLY PERFECT COUPLE.

She was a widow and her second venture was a widower. He was a gentle soul and had n't much to say in response when his wife had a great deal to remind him of, especially when she compared him with her former, but when he did speak it counted. One night he went to sleep while she was telling him the old, old story. She followed him shortly. Along in the middle of the night she was awakened by his uneasy turning.

"John," she said, "Are you awake?"

"Yes, Susan," he replied softly.

"What's the matter?"

"Oh, nothing, Susan; I was just thinking if your first had married my first they would have been the only perfect couple on earth."

Then he went to sleep again—while she was talking. —*December Lippincott's.*

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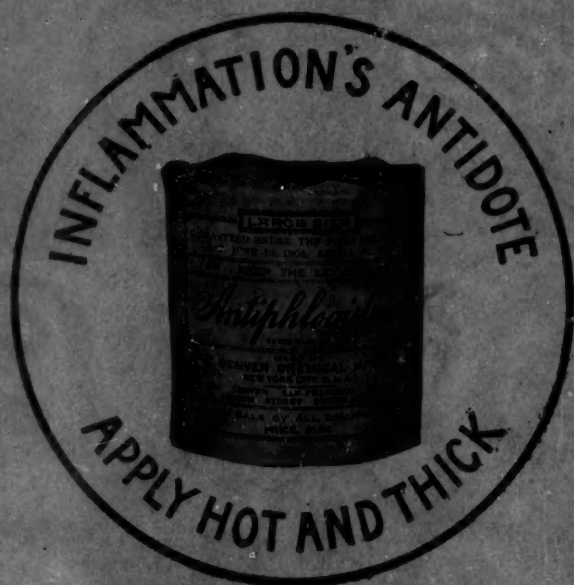
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